EFFECTIVENESS OF ALOEVERA JUICE ON REDUCTION OF BLOOD GLUCOSE LEVEL AMONG PATIENTS WITH DIABETES MELLITUS IN KULASEKHARAM VILLAGE AT KANYAKUMARI DISTRICT.

DISSERTATION SUBMITTED TO

THE TAMILNADU DR.M.G.R.MEDICAL UNIVERSITY

CHENNAI

IN PARTIAL FULFILLMENT FOR THE DEGREE OF

MASTER OF SCIENCE IN NURSING

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BY

Mrs. S. RETNA SAHUJA

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SRI. K. RAMACHANDRAN NAIDU COLLEGE OFNURSING

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A STUDY TO ASSESS THE EFFECTIVENESS OF ALOEVERA JUICE ON REDUCTION OF BLOOD GLUCOSE LEVEL AMONG PATIENTS WITH DIABETES MELLITUS IN KULASEKHARAM VILLAGE AT KANYAKUMARI DISTRICT.

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CHAPTER I

INTRODUCTION

"All that mankind needs for good health, and

healingis provided in nature.

The challenge of science is to find it!"

-Paracelsus, the Father of Pharmacology

BACKGROUND OF THE STUDY

Diabetes mellitus is a global problem with devastating human, social and economic impact. Diabetes mellitus is the forth leading cause of death in most developing countries.India leads the world with largest number of diabetic subjects earning the distinctionof being termed the "diabetes capital of the world". **(Indian council of medical research, New Delhi).**

Once regarded as a single disease entity, diabetes is now seen as a hetererogeneous group of diseases, characterized by a state of chronic hyperglycemia, resulting from a diversity of aetiologies,environmental and genetic acting jointly. Diabetes is an iceberg disease. Global wide diabetes is fourth leading cause of death. In USA 14.8%,Greece 30.8%, Belgium 33.3%, Barbados 48.2% are affected with diabetes mellitus.The prevalence of diabetes mellitus in India is 1.73%, in urban population 0.95% in Delhi, 3.8% in Ahmadabad. Rural population 0.60% in Cuttack and1.93% in Ahmadabad.In Trivandrum 1.83% in urban and 1.00% in rural.(**Park 1998**).

In 2000 the worldwide estimate of the prevalence of diabetes was 171 million people. In 2005 diabetes affect 246 million people and expected to affect 380 million by 2025. Today more than 250 million people worldwide are living with diabetes mellitus and each year another 7million develops diabetes mellitus.

Diabetes mellitus is a group of metabolic diseases characterized by increased levels of glucose in the blood resulting from defects in insulin secretion, insulinaction, or both.**(American diabetes association 2004).**

The risk factors of diabetes mellitus include age over 45years,parents or sibling with diabetes,gestational diabetes or delivering a baby weighing more than 9 pounds, obesity, lack of physical exercise,previously identified impaired fasting glucose tolerance,hypertension (more than 140/90mm of Hg), high density lipoprotein level ≤35mg/dl and or triglyceride level ≥250mg/dl**. (Expert committee on the diagnosis and classification of diabetes mellitus, diabetes care 2004).**

Genetic variants in the innate immunity pathway and its related inflammatory event are associated with some metabolic risk factors for type2 diabetes mellitus.**(Arora 2011).**

The different types of diabetes are type1diabetes mellitus,type2 diabetes mellitus,prediabetes,gestational diabetes mellitus&secondary diabetes mellitus.

In Type 1 diabetes, the insulin producing pancreatic beta cells are destroyed by an autoimmune process. As a result the person produces little or no insulin and requires insulin injections to control their blood glucose levels. It affects approximately 5% to 10% of the people with diabetes. It is characterized by an acute

onset, usually before 30years of age.**(Centers for disease control and prevention 2004).**

Type 2 diabetes is the common type. It occurs in people over 35years of age&overweight.In thisinsulin produced is either insufficient for the needs of the body or is poorly utilized by the tissue. Type 2 diabetes affects 90% to 95% of people with diabetes.**(National institute of diabetes and digestive and kidney disease 2005).**

Gestational diabetes mellitus is form of glucose intolerance which is diagnosed during pregnancy. Hyperglycemia develops during pregnancy because of the secretion of placental hormones which causes insulin resistance. During pregnancy, it is treated with insulin injections to normalize maternal blood glucose levels and to avoid complications to the fetus. Women who have had gestational diabetes have a 20 percent to 50 percent chance of developing diabetes in the next 5 to 10 years. After pregnancy, 5 percent to 10 percent of women with gestational diabetes are found to have type 2diabetes.

The classic symptoms of diabetes arepolyurea, polyphagia, polydipsia&other symptoms like fatigue, recurrentinfections; recurrent vaginal yeast infections prolonged wound healingandvisual changes.

The criteria for diagnosing diabetes mellitus are, fasting plasma glucose level greater than or equal to 126mg/dl,random plasma glucose level greater than 200m/dl plus symptoms of diabetes &2hour oral glucose tolerance test level greater than 200m/dl using a glucose load of 75gram.**(American diabetes association 2004).**

When the diabetes is not kept under control it leads to acute complications like diabetes ketoacidosis,hyperosmolar Hyperglycemic syndrome, hypoglycemia and

chronic complications like macro vascular complications such as coronary artery disease and micro vascular complications such as diabetic retinopathy, diabeticneuropathy, diabeticnephropathy and other complications like foot ulcer and peripheral artery diseases.

The metabolic and endocrine alterations of diabetes affect bone quantity and quality. These skeletal changes increase the risk of bone fracture. In type 1 diabetes the decreased bone mass, lack of insulin and insulin-like growth factor-1, deregulation of adipokines, and increased levels of proinflammatory cytokines are in the background of fragility fractures.**(Korányifasor 2010).**

Though diabetes is not curable it is controllable to great extent .The control of diabetes mostly depends on the patient and diet exercise .There are two approaches to diabetes management; pharmacological and non-pharmacological interventions. Pharmacological interventions used are insulin therapy,oral hypoglycemic drugs like sulfonylurea, biguanides,alpha glucosidase inhibitors&dipeptidase inhibitors.

Pancreas replacement is the surgical measure done for diabetes mellitus. As a non pharmacological management diet, exercise, certain herbs&species helps to lowerthe blood glucose levels.

The diabetes clients are advised to take diets such as 50 to 60 percent of calories from carbohydrates,20 to 30 percent from fat and remaining 10 to 20 percent from protein.**(American dietetic association 2005).**

Exercise lowers blood glucose levels by increasing the uptake of glucose by muscles, altering lipid concentrations, increasing levels of high density lipoproteins, and decreasing triglycerides and low density lipoproteins **(Nathan 2005).**

Fiber and protein contain foodsarerecommended for diabetes. And advised to avoid carbohydrate, sugar, fat contain foods and to reduce fatty acids in the diet and supplement with fruits and more vegetables which is essential for healthy living and strong immune system.There are also certain herbs which are used commonly among diabetic peoples.**(Lucqman Arafat & Ran deep Guleria2007).**

National survey shows that57% of the population areusing the complementary and alternative medicine.Among them 35%reported that they are using complementary therapy for diabetes. Therapies used for diabetes included are spiritual practices 28% , herbal remedies 7% and diet6%**(National survey 1997-1998).**

Aloeverais a desert plant. It belongs to lily family and has compounds like lophenol, 24-methyl-lophenol, 24-methylene cycloartanol,24-ethyl lophenol and cycloartanol which has anti hyperglycemiceffect.Phytosterolcompounds like beta sitosterol, beta sistosterolinand triterpenes which stimulates the release of insulin by islets of langerhans and inhibits glucose6 phosphatase.**(pharmaceutical society of Japan).**

Study was conducted on role of selected Indian plants in the management of type2 diabetes concluded that aloeverastimulate and regenerate beta cells and produce the hypoglycemia.**(Saxena2004).**

Five year study done in India on 5000 patients found that the patients who had taken aloevera had a significant reduction in fasting blood glucose level.**(Alavadi,Arafet2005).**

Most of the nursing interventions fit within the real of the natural therapies the illness paradigm shift and converge, and the role of nurses shifts can gives to healer. Thereforealoevera juice could be a suitable intervention for reducing blood glucose level.

NEED FOR THESTUDY

According to WHO"The prevalence of diabetes for all age groups worldwide was estimated to be 2.8%in 2000 and 4.4% in 2030. The total number of people with diabetes is projected to rise from 171 million in 2000 to 366 million in 2030.It is higher in men than women. Theprevalence across the world appears to be increased in the proportion of people above 65years of age."

Study doneregarding the prevalence of diabetes mellitus in different regional and religion of south Asian communities concluded that the Asian groups had a high prevalence of diabetes, in spite of their known dietary, cultural, and socioeconomic differences.**(Simmons, William &Powellmy2010).**

In Southern India age, sex, body mass index, smoking and alcohol consumption are major risk factor for the development of diabetes mellitus."**(Bodhini, Radha, Ghosh, SanapalaMajumder, Rao& Mohan 2010).**

The five countries with the largest amount of people diagnosed with diabetes were India (40.9 million), China (38.9 million), UnitedStates (19.2 million), Russia (9.6 million) and Germany (7.4 million).**(Mohan V 2007).**

In India the number of people with diabetes is around 40.9 million is expected to rise to 69.9 million by 2025.**(International Diabetes Federation 2006).**

In south India the incidence of diabetes and impaired glucose tolerance had been increasing since 1984 about 3.2 million die of diabetes across the world every year.**(Lefebure 2006).**

The overall crude prevalence of diabetes using WHO criteria was 15.5%(age standardised 14.3%).From 1989 to 1995 the prevalence of diabetes in Chennai increased by 39.8%(8.3to 11.6%); between 2000to 2004, by 6%(13.5 to 14.5) ($P<0.001$).Asian Indians appear to have greater riskfor cardiovascular complication and the prevalence of micro vascular complications are lower than in Europeans. The overall prevalence of diabetic retinopathy in Chennai was 17.6% and higher in men than women. The risk of diabetic retinopathy increased 1.89 fold for every 2%elevation of glycosylated haemoglobin.Diabeticneuropathy is 29% higher in newly diagnosed diabetes subjects and rate of amputation is higher in rural than urban area.**(Chennai Urban Rural EpidemiologyStudy2006).**

The active smokers have 44% increase risk of developing diabetes mellitus compared with non smokers. **(Carole Willi2006)**

A population based study which was conducted in six metropolitan cities across India in 11216 subjects aged 20 and above representative of all socioeconomic status. An oral glucose tolerance test was done using capillary blood. The result

showed that the age standardized prevalence of type 2 diabetes was 12.1% and higher in Chennai that is 13.5 also 14%with impaired glucose tolerance with high risk of conversion of diabetes.**(The National Urban Diabetes Survey 2005).**

The relationship between obesity and diabetes mellitus revealed thatin both males and females the mean BMI were higher in diabetes subjects than non diabetes subject.**(Shah 2004).**

A study carried out in 108 centres 49 urban and 59 rural to look at the differences in the urban and rural prevalence of type2 diabetes and glucose intolerance. According to the American Diabetes association criteria the prevalence of diabetes was 4.7% in the urban compared to 2.0% in the rural population. Both micro vascular and macro vascular complications cause significant morbidity and mortality in diabetes subjects. **(The prevalence of diabetes in India study 2004).**

Study conducted to find out the prevalence of diabetes mellitus showed that men of the age 45 and above had highest prevalence (7.6%), and women between 18-44 years had the lowest prevalence (0.0%) of diabetes mellitus The diabetes risk factor like work related factors place higher risk for diabetes.93%of men and 10% of women did fulltime work. This study result concluded that work related stress, and managerial occupation are highest link for prevalence and risk of diabetes.**(Akiko S. Hosler2003).**

16.9 million people age 20 or older have diabetes and one million new cases of diabetes are diagnosed per year in this population group. That is 2,200 new cases a day. The incidence of diabetes is much higher in those over 65. In the United States an estimated 7.8 million men of all ages have diabetes while 9.1 million women have

the diabetes. A person living in India suffering from diabetes is12%.**(National institutes of Health Statistics 2003).**

Study conducted regarding prevalence of complication of diabetesshowed that the prevalence of coronary artery disease was 21.4 percent among diabetes subjects compared to9.1 percent in subjects with normal glucose tolerance. The prevalence of peripheral vascular disease was 6.3 percent among diabetes subjects compared to 2.7 percent in non diabetes subjects. Prevalence overt nephropathy was 2.2 percent in Indians while microalbuminuria present in 26.9 percent. The metabolic abnormalities like obesity and cardiovascular risk factors were higher in middle income group.**(The Chennai urban populationstudy 2003).**

Apopulation-basedsurvey done on 15 000 adults to determine whether gastrointestinal symptomsare more frequent in persons with diabetes, particularly inthose with poor glycemic control. He concluded Diabetes mellitus is associated with an increasedprevalence of upper and lower gastrointestinal symptoms. Thiseffect may be linked to poor glycemic control but not to durationof diabetes or type of treatment.**(Peter Bytzer, Nicholas &Talley 2002).**

A study conducted in New Delhi showed that slum dwellers had high prevalence of glucose intolerance and obesity andinfections were leading cause of mortality in diabetes subjects.**(Bansali2002).**

A prospective studydone to estimate the effect of intentional weight loss on mortality in overweight individuals with diabetes. The result shows Intentional weight loss was reported by 34% of the cohort. Intentional weight loss of 20-29 lb was associated with the largest reductions in mortality (approximately 33%).Weight loss

>70 lb was associated with small increase in mortality. He concluded that intentional weight loss was associated with substantial reductions in mortality though this observational study of overweight individuals with diabetes.**(Williamson& Thompson2001).**

The investigator selected this study because during her clinical experience she observed that many clients were suffering from complications of diabetes like leg ulcers due to non adherence to the treatment regimen because of side effects and cost of hypoglycemic medications.Aloevera is safe herb with no side effects and easily available. Hence the investigator was interested in assessing the effectiveness of aloevera for reducing blood glucose level among patients with diabetes mellitus.

STATEMENT OF THE PROBLEM

A study to assess the effectiveness of aloevera juice on reduction of blood glucose level among patients with diabetes mellitus in Kulasekharamvillage, atKanyakumari district.

OBJECTIVES

1. Toassess the blood glucose level among patients with diabetes mellitus.
2. To find out the effectiveness of aloevera juice on blood glucose level among patients with diabetes mellitus.
3. To associate the post-test blood glucose level ofpatients with diabetesmellitus with theirselected demographic variables.(Age, sex, education, occupation, religion,dietary habits, income, life style practice and family history of diabetes mellitus)

HYPOTHESES

All hypotheses will be tested at 0. 05 level of significance.

H_1: The mean post-test blood glucose level will be significantly lower than the mean pre-test blood glucose level among patients with diabetes mellitus.

H_2: There will be significant association between post-test blood glucose level ofpatients with diabetes mellitus with their selected demographic variables (age, sex, education, occupation, religion, dietary habits, income, life style practice, and family history of diabetes mellitus).

OPERATIONAL DEFINITION

Assess

It is the systematically and continuously collecting, validating and communicating patients data regarding the reduction of blood glucose level among diabetes patients by glucometer.

Effectiveness

Effectiveness means the result which shows out. In this study effectiveness means the reduction of blood glucose level among diabetic patients after receiving aloevera juice.

Aloevera juice

When the outer portion of the skin of aloevera leaf is peeled away, the exudate is a transparent slippery mucilage or gel produced by the thin walled tubular cells in the inner parenchyma of the leaf. The raw gel resemblescolorless gelatin with hair like

matices and when it is blended the juice is produced and 15ml juice is administered in empty stomach once daily for seven days.

15ml of aloevera juice contains:

- Lophenol 2mcg
- 24-methyl-lophenol 1.5mcg
- 24-methylene cycloartanol 2.3mcg
- 24-ethyl lophenol 2.4 mcgAnti hyperglycemic effect
- Cycloartanol3mcg
- Beta sitosterol 2.6mcg
- Beta sistosterolin 3mcg
- Triterpenes 2.7mcg
- Carbohydrate 0.5 gm
- 20 minerals like calcium,iron
- 18 amino acids like acemanan,mannose 6- phosphate
- Enzymes like oxidase and catalase

Blood glucose level

In this study blood glucose refers to fasting blood glucose level between 126 mg/dl to 200 mg/dl.

Patients

Patients refer to both male and female persons with diabetes mellitus under the age group of 40 – 70 years residing inKulasekaram village at Kanyakumari District.

Diabetes mellitus

Diabetes mellitus is a group of metabolic diseases characterized by increased levels of glucose in the blood resulting from defects in insulin secretion, insulin action or both. In this study diabetes mellitus refers to patients who are newly diagnosed with diabetes mellitus and whose fasting blood glucose level is in the range of 126 mg/dl to 200 mg/dl.

ASSUMPTIONS

The study was based on the assumption that,

- Blood glucose level can be reduced by intake of aloevera juice.
- Blood glucose level vary from person to person.
- Aloevera juice has no side effects.

DELIMITATIONS

1. The study is delimited for only four weeks of data collection.
2. The study is limited to a sample of 60 patients with diabetes mellitus.

3. Thestudy is limited to one group only and there was no control group.

PROJECTED OUTCOME

1. Administration of aloevera juice will reduce the blood glucose level and prevent the development of complications due to diabetes mellitus.
2. The findings of the study will help the nurses to plan and use complementary therapy in reducing blood glucose level among the patients with diabetes mellitus.

CONCEPTUAL FRAMEWORK

The conceptual framework for research study presents the measure on which the purpose of the proposed study is based. The framework provides the perspective from which the investigator views the problem.

The study is based on the concept that the effectiveness of oral administration aloevera juice on reduction of blood glucose level among adults who has elevated blood glucose levels.

The investigator adopted the modified Ludwig Von Bertalanffy's general system theory.

Living system is open because there is an ongoing exchange of matter, energy and information. In general system theory, the system is composed of both structural and components that interact with in boundary, which filter the type and rate of exchange with the environment.

The adult is capable of taking energy and information from the environment and revealing them to the environment. Because of this exchange, adult is an open system.

According to general system theory for survival, an adult must achieve a balance internally and externally. Equilibrium depends on the adults' ability to regulate input and output to achieve a balanced relation of the interactive part and the process applied for proper balance. The adult person uses various adaptation mechanisms to maintain equilibrium. Adaptation may occur through accepting

orrejecting the matter energy or information or by accommodate the input and modifying the blood glucose levels.

Ludwig Von Bertalanffy's general system theory focuses on 3 areas:

- **Input**
- **Throughput**
- **Output**

1. Input

According to general system theory input refers to the matter energy or informationfrom the environment into the system. Here the input includes subject's age, sex, education, occupation, family history of diabetes mellitus, and life style habits of subjects. The main aspect of input is the assessment of blood glucose level and both are open systems which are interacting with each other.

2. Throughput

In this model throughput refers to the procedure by which matter, energy and information that is modified or transformed within the system. In the present study it includes administration of aloevera juice to patients with diabetes mellitus.

3. Output

Output refers to matter, energy and information that are released from the interaction of the system into the environment. In the present study it refers to the post assessment of blood glucose level and outcome of the system interaction that is effectiveness of aloevera juice on reducing blood glucose level.

CHAPTER-II

REVIEW OF LITERATURE

Review of literature is defined as a critical summary of review on a topic of interest, often prepared to put a research problem in contest (**Polit& Beck 2006**).

The review of literature in the research report is a summary of current knowledge about a particular practice problem and includes what is known and not known about the problem. The literature is reviewed to summarize knowledge for use in practices or to provide a basis for conducting a study **(Burns 1997)**.

This study examined the effectiveness of oral administration of aloevera juice on reduction of blood glucose level among patients with diabetes mellitus. From the collected review of various associated literature and research studies, topics can be divided as follows;

Section A: Studies related to prevalence and complications of diabetes.

Section B:Studies related to effectiveness of aloevera juice on diabetes mellitus.

Section C: Studies related to using aloevera in other conditions.

Section A: Studies related to prevalence and complications of diabetes mellitus

GojkaRoglic (2011) conducted a study to assess the global prevalence of diabetes. Data was collected by age and sexfrom a limited number of countries were extrapolated to all 191 World Health Organizationmember states and applied to United Nations' population estimates for 2000 and 2030. Urban and rural populations

were consideredseparately for developing countries. The study concluded that the prevalence of diabetes for all age-groups worldwide was estimated to be2.8% in 2000 and 4.4% in 2030. The total number of people with diabetes is projected to risefrom 171 million in 2000 to 366 million in 2030. The prevalence of diabetes is higher in menthan women, but there are more women with diabetes than men. The most important demographic change to diabetes prevalence across the world appears to be the increase in theproportion of people 65 years of age. These findings indicate that the "diabetes epidemic" will continue evenif levels of obesity remain constant.

The Indian Council of Medical Research Task Force on Diabetes (2010) conducted a study to assess the prevalence of diabetes in India. It was performed at six centres in the country. Population sampling in urban areas was based on stratified random design and in rural areas on cluster sampling. Population aged > 14 years was screened using post 50 g oral glucose load and capillary blood glucose > 9.4 m.mol/L (> 170 mg/dL) was taken as diabetes. In all, 34,194 subjects were screened and prevalence of diabetes was 2.1% in urban subjects and 1.5% in rural populations.

The Indian Council of Medical ResearchStudy (2010) conducted a study to assess the prevalence of diabetes mellitus in Tamil Nadu. Around 1,200 people aged 20 and above from urban areas and 2,800 from the state's rural areas took part in the survey and found that Tamil Nadu has the highest number of diabetics in the country, with 9.8 per cent of the state's population (42 lakh people) living with the disease. It also showed that 30 lakh people in the state are at high-risk of developing diabetes .The research also found that abdominal obesity in the Tamil Nadu was as high as 22.4 per cent in males and 35.3 per cent in females. In addition, it revealed that 27.8

per cent of the population hashypertension as risk factors for developing diabetes mellitus.

Sanjay et al., (2009) done a study to estimate the usefulness of the Indian diabetes risk score (IRDS) for detecting undiagnosed diabetes in the rural area of Tamil Nadu,covering a population of 35000 using a predesigned and pretested protocol. Most of the respondents 1411 (73%) indulged in mild to moderate physical activity. 1715 (87.91%) had no family history of diabetes mellitus. 750 (39.64%) individuals were in the overweight category (>25 BMI). Out of these overweight persons, 64% had high diabetic risk score. It is observed that chances of high diabetic score increase with the increase in BMI. Prevalence of diabetes in studied population was 5.99%; out of these, 56% known cases of diabetes mellitus had high (>60) IDRS. Co-relation between BMI and IDRS shows that, if BMI increases from less than 18.50 to more than 30, chances of high risk for developing diabetes mellitus also significantly increase.

The Central India Eye and Medical Study (2007) conducted a population-based cross-sectional study in Central India. The first phase was carried out in 4 villages in the rural region of Central Maharashtra2414 subjects. Diagnosed 135 (5.6%) as patients with diabetes. Prevalence of diabetes was similar for men and women, and rose with age in both. In univariate analysis, the prevalence of diabetes increased with age body weight, and body mass index. Prevalence was increased with higher mean serum concentrations of cholesterol, lower concentration of high-density lipoproteins, less physical activity, more time spent sitting or reclining, and more hyperopic refractive error.

Linton et al., (2006) done a study in 108centres (49 urban and 59 rural) in different parts of India to look at the urban-ruraldifferences in type 2 diabetes and glucose intolerance. Diabetes was definedaccording to WHO and ADA criteria. According to ADA criteria, the prevalence ofdiabetes was 4.7% in the urban and 1.9% in the rural areas. The prevalence ofdiabetes according to WHO criteria was 5.6% and 2.7% among urban and rural areas respectively.

Sushil et al. (2011)conducted a study to estimate the prevalence of diagnosed and un diagnosed diabetes mellitus in eight states in waves. At a time with 2000 patients from 100 centers per wave. Each center enrolled the first ten paients per day on two consecutive days.Screeening test for diabetes mellitus was done for 1903 patients.The over all prevalence of diabetes mellitus was 34%, overweight 70%, truncal obesity 89% and most patients 75% with known diabetes mellitus were on treatment.

Orchard T. J. et al.,(2011) conducted a study to assess the association between pulse wave analysis and cardiac autonomic neuropathy in type1diabetes mellitus patients using a cross sectional method. Both cardiac autonomic neuropathy and pulse wave analysis for arterial stiffness and myocardial perfusion measures were obtained from 144 participants with the 18-year follow-up examination. Cardiac autonomic neuropathy was measured as variability in the R-R interval during deep breathing, and pulse wave analysis was performed using SphgymoCorPx. Univariate and multivariable analyses were used. Results showed presence of cardiac autonomic neuropathy wasunivariately associated with all three pulse wave analysis measures: the augmentation index odds ratio =1.5, P=0.03, augmentation pressure was 2.1, P=0.001, and sub endocardial viability ratio was 0.4, P<0.001. These relationships

persisted for age and diabetes-related factors glycosylated hemoglobin, systolic blood pressure, and overt nephropathy. The study concluded that cardiac autonomic neuropathy is cross-sectionally associated with measures of both increased arterial stiffness and decreased myocardial perfusion in type 2diabetes.

Aguilar Salinas et al.,(2011)conducted a study to assess the relationship between the ankle-arm index determined by Doppler ultrasonography and cardiovascular outcomes and amputations, in a group of patients with type 2 diabetes mellitus.Correlation of Pearson and logistic regression methods are used. The ankle and arm index was measured in 242 patients. The prevalence of ischemic ankle and arm index (< 0.90) was 13.6%. The Pearson correlation coefficient for ankle and arm index pathological and cardiovascular outcomes was 0.180 ($p = 0.005$), amputation 0.130 ($p < 0.05$), retinopathy 0.132 ($p < 0.05$), and nephropathy 0.158 ($p = 0.01$). In logistic regression analysis, the factors associated with pathological ankle/arm index were age > 51 years, cardiovascular outcomes, and amputation. The study concluded that the diabetic patients have a high prevalence of pathological ankle and arm index.

Jiang et al.,(2011)done a study to find out the prevalence of overweight and its relationship with hyperglycemia in adults of rural China. A cross-sectional method wasused and samples were randomly selected. A total sample size was 5840 subjects aged 18 to 64 years. The length, weight, fasting glucose of subjects was measured. EpiData 3.1 was used for the data and SPSS 16.0 was used for statistical analysis. The average body mass index was 22.7 +/- 11.6 kg/m^2, the crude prevalence of overweight was 25.1%, obesity was 3.8%and the age-gender-standardized prevalence of overweight was 21.8%. There was a significantly higher trend of overweight with age regardless of gender, especially after 35 years old. Chi-square was 5.61, P = 0.018 for

men, 50.96, P < 0.001 for women 14.05, P < 0.001.The risk of impaired fasting glucose anddiabetes mellitus in subjects with overweight was significantly higher than that in subjects without overweight/obesity.The study concluded that the prevalence of overweight was significantly associated with impaired fasting glucose and diabetes mellitus.

Kliesch et al.,(2010)conducted a study to assess the influence of diabetes mellitus on male reproductive function concluded that diabetic men have been found to have a significantly higher percentage of sperm with nuclear DNA damage. The identification of high levels of advanced glycationend products and their receptor throughout the male reproductive tract coupled to changes in testicular metabolite levels and spermatogenic gene expression suggest that glycation may play an integral role in oxidative stress which in turn causes sperm DNA damage.

Mustaffa B. E(2010)conducted a study to assess the ethnic differences in prevalence and complications of diabetes mellitus in peninsular Malaysia.The estimated prevalence of diabetes mellitus in Malaysia was about 2%. Diabetes was most common in Indians especially male. Positive family history was obtained in 14% of cases most commonly in Malays, almost 1/3 of who had more than one family member with diabetes. Over 50% of patients were overweight. Obesity was noted in nearly 70% of female Malays and Indians.More than 80% of patients were non insulin requiring. Youth onset diabetes was considered rare; those 10 years and below were estimated to be only 0.4% and below 20 years of age between 2%-4% of the diabetic population. Females were twice as common as males in this type of diabetes and familial association was greater. More than half of hospital-based patients had evidence of complications, mainly amongst Malays and Indians. Hypertension was

the most frequent associated disease followed by foot ulcers and ischemic heart diseases. The major causes of death were chronic renal failure, myocardial infarction, ketoacidosis, stroke and septicemiarelated to gangrene.

Kenneth (2010) conducted a cross-sectional, household study aims to assess the prevalence and awareness of diabetes mellitus in rural areas. The study was conducted on 45-65 age groups. Structured questionnaire was used to assess the knowledge of diabetes and fasting blood glucose level was done to detect diabetes. The result showed that 358 adults screened had hyperglycemia. More than half (75%) of them were not aware about of diabetes and diabetic care.

Section B: Studies related to effectiveness of aloevera juice on diabetes mellitus.

Frank(2004)conducted a comparative study to assess the effectiveness of the aloevera juice against placebo juice in 50 patients newly diagnosed with non-insulindependent diabetes mellitus using double-blind, randomized, and controlled trial approach. They were administeredaloevera juice 15 ml twice daily for there months. The result showed that the Mean ± S.D blood glucose concentrations decreased to 161.9 ± 9.1 mg/dL (from 260.4 ± 10.7 mg/dL at baseline) in the intervention group but remained similar at 252.1 ± 7.8 mg/dL (compared with 258.1 ± 8.0 mg/dL at baseline) in the control group ($p< 0.01$) by day 90.

Devaraj et al., (2004) conducted a randomized, double-blind, placebo-controlled trial of 45 patients with prediabetes to examine the hypoglycemic effects and safety of aloevera gel. Patients received 10-15ml of aloeverajuice or placebo twice daily for eight weeks. Fasting blood glucose and urine glucose concentrations

were obtained at baseline and at eight weeks. Significant reductions (p<0.05) were seen in HbA_{1c}, fructosamine, insulin, and urinary F2-isoprostanes (a marker of oxidative stress) in the study group.

Yongchaiyudha et al.,(2004)conducted a placebo-controlled, single-blind study, to evaluate the effects of oral aloevera juice on reducing blood glucose level in 72 patients aged 35–60 years who had high fasting blood glucose and had not been previously treated with hypoglycemic drugs. Patients were equally divided into intervention and control groups. The study group received 1 tablespoonful ofaloevera juice once daily for 14 days, while the control group received a carminative (placebo) mixture. The result shows that the Mean ± S.D blood glucose concentrations decreased to 141.9 ± 4.1 mg/dL (from 200.4 ± 7.7 mg/dL at baseline) in the intervention group but remained similar at 202.1 ± 7.8 mg/dL (compared with 204.1 ± 8.0 mg/dL at baseline) in the control group (p< 0.01) by day 14.

Ferbet et al., (2003) conducted a placebo-controlled studyinMahidolUniversity, Bangkokto investigate the effectiveness of aloevera juice for patients suffering from diabetes mellitus. 72 patients (aged 35-60 years) with a high fasting blood sugar level and a typical diabetic glucose tolerance test result were assigned to a treatment or placebo group. The patients in the treatment group received one tablespoon of aloevera juice twice a day for 42 days. Fasting blood glucose levels were measured weekly. The results showed that the average blood glucose level of the patients in the aloevera juice group was significantly reduced from the second week of the study and continued to fall throughout the treatment period, whereas there were no changes reported in the placebo group, in the treatment group, blood glucose levels fell from an average of 250.36 (+/- 7.65mg%) to 141.92 (+/-4.12mg%) by day 42.

Chalaprawat(2003)conducted a comparative study to assess the effectiveness of thealoevera juice against placebo juice in 16 asymptomatic, normotensive Thailand patients newly diagnosed with non-insulin-dependent diabetes mellitus who were not concurrently taking hypoglycemic agents using crossover, double-blind, randomized, controlled trial approach. Participants were divided into two groups (n = 8 in each) receiving aloevera juice prepared from aloevera extract or placebo juice, was administered as 15 ml twice daily. In the group that received placebo first, mean plasma glucose concentrations were 252 mg/dl before crossover and 256 mg/dl after crossover. Similarly, mean plasma glucose concentrations were 229 mg/dl (aloe) and 239 mg/dl (placebo) in the group that received the aloevera juice first.

Tariq et al., (2003) conducted a study to assess the effectiveness of aloevera on non insulin diabetes in five Swiss diabetes patients. They received, half a teaspoonful of aloevera juice daily for 4-14 weeks, the fasting serum glucose level fell in every patient from a mean of 273 +/- 25 to 151 +/- 23 mg/dl (p less than 0.05).

Yagi et al., (2002)conducted an observational study to assess the effectiveness of aloevera on 15 patients age 42–55 years whose type 2 diabetes mellitus was uncontrolled on metformin and glyburide. Participants received 2 tablespoonful's (0.05 g) of aloevera gel high-molecular-weight fractions (AHM) three times daily for 12 weeks. AHM was prepared from water-washed gel of aloevera leaves. The end product had <10 ppm of barbaloin. By the end of the study, fasting blood glucose concentrations had decreased 32% from baseline (baseline concentration of 235 mg/dl estimated from a graph) and had decreased 20% from HbA_{1c} baseline (baseline of 7.6% estimated from a graph) (p< 0.001 for both endpoints).

Agarwal (2002) conducted an observational study to assess the effectiveness of aloevera insixty patient's age 35–65 years with diabetes mellitus. The study patients were given aloevera as a bread by mixing 100 gram of fresh flesh gel from the aloevera plant, 20 g of husk of isabgol (psyllium husk), and wheat flour. The bread was to be consumed twice daily. At the end of three months, more than 93% of the patients had returned to normal ranges. The result shows that the Mean ± S.D blood glucose concentrations decreased to 124 ± 3.6 mg/dl (from 216 ± 5.7 mg/dl at baseline).

Ghannam et al., (2002) a study to assess the effectiveness of aloevera latex in the form of dried resin for the reduction of non insulin dependent diabetes mellitus patients. The sample size chosen was 50. After a run-in period with no treatment of 2–24 weeks, patients received a half-teaspoonful of aloe latex, in the form of dried resin, daily for 4–14 weeks. Mean ± S.D. fasting serum glucose concentrations decreased in all patients from a baseline 273 ± 56 mg/dl to 151 ± 51 mg/dl after treatment ($p< 0.001$). Body weight and insulin levels remained unchanged. The patients were screened for HbA_{1c}, and a reduction from a mean of 10.6% to a mean of 8.2% was observed.

Mohammed Ali Ajabnoor(2002) conducted a study to assess the effectiveness of aloevera juice on reduction of blood glucose level on Type2 diabetes mellitus patients.15ml of aloevera juice was administered orally. The hypoglycemic effect of a single oral dose of aloevera juice on serum glucose level was very highly significant and extended over a period of 24 hours with maximum hypoglycemia observed at + 8 hour with the reduction of 23-54 mg/dl from the base line blood

glucose level.The hypoglycemic effect of aloeverajuice may be mediated through stimulating synthesis and/or release of insulin from the β-cells of Langerhans.

Section C: Studies related to using aloevera in other conditions.

Nasiff(2008)conducted a study toexamine the effectiveness of oral aloevera extract on lipid metabolism in patients with hyperlipidemia uncontrolled by dietary interventions.Sixty patients between the ages of 40 and 60 years with hypercholesterolemia and hypertriglyceridemia were randomized into three groups of 20 and received either 10 or 20 ml of aloevera or placebo daily. Lipid profiles were measured at baseline and at 4, 8, and 12 weeks. From baseline, the 10-ml group showed reductions in cholesterol, low-density lipoprotein (LDL) cholesterol, and triglyceride concentrations of 15.4%, 18.9%, and 25.2%, respectively. The 20-ml group showed reductions from baseline of 15.5% in cholesterol, 18.2% in LDL cholesterol, and 31.9% in triglycerides. In addition, patients in the 20-ml group had a 16.9% reduction in apolipoprotein B, another marker for atherosclerosis. In the placebo group, no significant changes in lipid parameters from baseline were noted.

Puebla(2008) conducted a randomized double blind placebo control study to assess the effectiveness of aloevera gel on fifty thrombophlebitis patients. Treatment was givenon twosubsequent days with aloevera gel. Thrombophlebitis were significantly reduced (97.5%) after 48 hours than placebo.

Sarakarnet al., (2007) conducted a study to assess the effectiveness of aloevera gel on reduction of burning pain management of oral lichen planus in Srinagarind hospital Medical School Thailand. Researcher used randomized double blind approach. 54 patients were randomized into two groups and received

aloeveragel and placebo.81%had a good response with aloevera gel 4%had a similar response in placebo.7% with aloevera el had complete clinical remission. Burning pain completely disappeared in 33% with aloevera. (P<0.001)

Syed et al., (2006) conducted two trials on the efficacy of aloevera for first episodes of genital herpes in men. In the studythey randomized 120 men into three parallel groups. Each patient applied aloevera cream (aloevera extract 0.5% in hydrophilic cream), aloevera gel, or placebo three times daily for two weeks. Aloevera cream showed shorter mean duration of healing than aloevera gel and placebo (4.8 days versus 7.0 and 14.0 days, respectively). The numbers of cured patients were70%, 45%, and 7.5%, respectively (*P*<0.02). Of the 49 patients healed at the end of this trial period, six had a relapse after 21months of follow-up.

Fulton (2005) documented the effects of two different dressings for wound-healing management on full-faced dermabrasion patients. Eighteen patients suffering from acne vulgaris was choosen for the study. Their abraded faces were divided in half. One side was treated with a standard polyethylene oxide gel wound dressing, while the other side was treated with a polyethylene oxide dressing saturated with aloevera. After 48 hours with the aloevera dressing, intense vasoconstriction and a reduction in oedema was noted, less exudate and crusting were evident by the fourth day. By the fifth day, re epithelialization was complete to 90% on the aloe side compared with 40–50% on the control side. Overall, wound healing was approximately 72 hours faster at the aloe.

Visuthikosol V(2004) conducted a comparative study to assess the effectiveness of aloevera gel and Vaseline for burn wound .The researcher studied 27 patients with partial thickness burn wound, they were treated with aloevera gel

compared with Vaseline. The result shows the average healing time for aloevera gel was 11.8days and 18.19 days for the Vaseline gauze treated wound.($P<0.002$).

Macklin Denise(2002)conducted a study to find out the effectiveness of aloevera gel for ulcerative colitis.Investigater used randomized control trial.44subjects were given either oral aloevera gel or placebo 100ml twice a day for 4weeks in a 2:1 ratio. At the end of 4 weeks oral aloevera produced clinical and histological improvement than placebo.

CHAPTER III

RESEARCH METHODOLOGY

Research methodology refers to the techniques used to structure a study and to gather and analyze information in a systematic fashion (**Polit&Hungler2008**). Methodology includes the steps, procedures and strategies for gathering and analyzing the data in the research investigation.

This chapter consists of research approach, research design, and variables in the study, setting of the study, population, and sample size, sampling technique, criteria for selection of sample, development and description of the tool,description of intervention, scoring key, content validity, pilot study, reliability, data collection procedure and plan for data analysis.

RESEARCH APPROACH

Quantitative approach was used for this study.In this the researcher lays out in advance the steps to be taken to maximize the integrity of the study and then follows those steps as faithfully as possible.**(Polit&Hungler2008).**

RESEARCH DESIGN

The research design adapted for the study was pre experimental one group pre-test post-test research design. It is diagrammatically represented as,

GROUP	PRE-TEST	INTERVENTION	POST-TEST
Experimental	O_1	X	O_2

Fig 2: Schematic Representation of Pre Experimental One Group Pre-Test Post-Test Research Design

Key:

O_1 - Pre-test fasting blood glucose level

X - Administration of aloevera juice

O_2- Post-test fasting blood glucose level

VARIABLE

Variables are characters that can have more than one value.

Independent Variable

Aloevera juice.

Dependent Variable

Level of fasting blood glucose.

SETTING OF THE STUDY

The study was conducted in Kulasekharam village KanyaKumari District.The total populationofKulasekharam village is five thousand one hundred and fifteen. Total male population is two thousand five hundred and seventy two and total female population is two thousand five hundred and forty three.The total family living in Kulasekharam village isthousand four hundred and sixteen. Thedistance of Kulasekharam village fromSri.K.Ramachandran Naidu College of Nursing is 120 Km.

STUDY POPULATION

Population included in this study was the patients with diabetes mellitus.

SAMPLE

Patients with the fasting blood glucose level between 126 mg /dl to 200 mg /dl residing in Kulasekharam village at Kanyakumari District.

SAMPLE SIZE

The sample size was 60.As it was a one group pre-testpost-test design all the samples received the intervention.

SAMPLING TECHNIQUE

The investigator got formal permission from the Director of the Primary Health Centre Kulasekharam.The investigator used a survey method to find out the patients with diabetes mellitus.The total family living in Kulasekharam village is 1416.The total population of Kulasekharam village is 5115. Total male population is 2572 and total female population is 2543. The total adults under the age group of 40-75years were 807. Among 807 people (410 were male and 397 were female) 412 peoples (211 were male and 201 were female)who fulfilled the inclusive criteria were selected. Rapport was established with the persons and a brief introduction about the study was given. Consent was obtained from each patient and reassurance was provided that the collected data would be kept confidential and fasting blood glucose was checked using glucometer.Among 412 people,320 persons had normal blood glucose,26 persons had stage I diabetes mellitus,30 persons had stage II diabetes mellitus,27 persons had stage III diabetes mellitus and nine persons had hyperglycemia.Among that population 83 persons (39 were males and 44 were females) had stage I, stage II and stage III diabetes mellitus.Per day 22-23 persons fasting blood glucose were checked. Among that 17-18 persons had normal blood

glucose, one to two persons had stage I diabetes mellitus, stage II diabetes mellitus,stage III diabetes mellitus and zero to oneperson had hyperglycemia. From that 60 samples (25 male and 35 female) were selected by using convenient sampling technique.

CRITERIA FOR SAMPLE SELECTION

The sample was selected based on the following inclusion and exclusion criteria.

Inclusion Criteria

1. Diabetes patients who has fasting blood glucose level between 126 mg/dl to 200 mg/dl
2. Diabetes patients who are able to understand Tamil and English.
3. Diabetes patients who are willing to participate in the study**.**

Exclusion Criteria

1. Diabetes patients who take hypoglycemic agents.
2. Persons who takes corticosteroids.
3. Persons who have systemic disease.
4. Diabetes patients who have blood glucose level more than 200mg/dl.
5. Persons who have blood glucose level less than 126 mg/dl.
6. Diabetes patients who have complications of diabetes mellitus like diabetic neuropathy,diabeticnephropathy and diabetic retinopathy.
7. Persons who takes aloevera.

DEVELOPMENT AND DESCRIPTION OF TOOL

Description of Tool

The method and procedures employed for the collection of data are called techniques and instrument used are called tool.

The tools constructed in the study are as follows,

Section - A

It consists of a structured interview schedule. It had questions related to the demographic data of the patients.

Demographic Data

It includes patient's age,sex,education,occupation, religion,dietary habits, income,family history of diabetes mellitus and life style practices.

Section-B

Glucometer

One touch horizon glucometer was used to assess the blood glucose level.

SCORING KEY

BLOOD GLUCOSE LEVEL	INTERPRETATION	SCORE
70-125 mg/dl	Normal	0
126-150mg/dl	Stage I diabetes mellitus	1
151-175mg/dl	Stage II diabetes mellitus	2
176-200mg/dl	Stage III diabetes mellitus	3

DESCRIPTION OF INTERVENTION

Aloevera is a desert plant with a cactus-like appearance. It belongs to the family Lily. It is used in many conditions like hyperlipidaemia, in burns for wound healing, ulcerative colitis, to ease inflammation and to relieve arthritis pain and to boost the immune system. Aloevera juice is obtained from the inner portion of the leaves.

15ml of aloevera juice contains:

- Lophenol 2mcg
- 24-methyl-lophenol 1.5mcg
- 24-methylene cycloartanol 2.3mcg
- 24-ethyl lophenol 2.4 mcg
- Cycloartanol 3mcg
- Beta sitosterol 2.6mcg
- Beta sistosterolin 3mcg
- Triterpenes 2.7mcg

Anti hyperglycemic effect.

- Carbohydrate 0.5 gm
- 20 minerals like calcium, iron
- 18 amino acids like acemanan, mannose 6- phosphate
- Enzymes like oxidase and catalase

Aloevera juice was prepared by the following method,

- Harvested one or more leaves from aloevera plant. Used the knife to trim off the thorny edges of the leaf, and then rinsed in cold water.
- Splited the aloevera leaf into two halves. Scooped out the clear, translucent, inner gel from the splited leaf.

- Put the aloevera gel into a blender, and blended it and got the aloevera juice.

- Rapport was established with the patients and a brief introduction about the study was given.
- Consent was obtained from each patient and reassurance was provided that the collected data would be kept confidential.
- The data related to demographic variable was collected by interview method.
- Fasting blood glucose level was checked using glucometer and the patients who had blood glucose level of 126mg/dl to 200mg/dl was selected.
- 15ml of aloevera juice was administered orally once daily for 7days and againfasting blood glucose was checked on eighth day.

CONTENT VALIDITY

The content of the tool was established on the basis of opinion of one medical expert and three nursing experts in the field of medical surgical nursing and one expert from Siddha medicine.

RELIABILITY OF THE TOOL

Reliability of the tool was checked by the parallel method. The reliability score was r= 0.912 showed higher degree of consistency and correlation of the tools. Hence the tool was considered reliable for proceeding with main study.

PILOT STUDY

It is a rehearsal for the main study. In order to test the feasibility of the study a pilot study was conducted.The researcher got permission from Principal and

Research Ethical Committee of Sri. K.Ramachandran Naidu College of Nursing and HOD of medical surgical nursing. A formal permission was obtained from the Director of the Primary Health Centre. The pilot study was conducted in Arumanai village for the period of nine days (22.03.2011 to 31.03.2011) from 6am to 5pm. The sample size was six patients selected using convenient sampling technique. Rapport was established with the patients and a brief introduction about the study was given. Consent was obtained from each patient and reassurance was provided that the collected data would be kept confidential. The data related to demographic variable was collected by interview method. Fasting blood glucose level was checked using glucometer and the patients who had fasting blood glucose level 126m/dl to 200 mg/dl was selected.15ml of aloevera juice was administered orallydaily for seven days and againfasting blood glucose was checked on eighth day. The patients showed significant reduction of blood glucose. The study was found to be feasible and hence the same procedure was decided to be followed in the main study. There was no modification made in the tool after pilot study.

DATA COLLECTION PROCEDURE

The researcher got permission from Principal and Research Ethical Committee and HOD of medical surgical nursing, Sri K. Ramachandran Naidu College of Nursing. Before the data collection a formal permission was obtained from the Medical Director of Primary Health Centre,Kulasekharam for conducting main study. The data were collected from 01.04.2011 to 30.04.2011 between 6.00 a.m. to 5p.mseven days a week.The investigator used a survey method to find out the patients with diabetes mellitus.The total family living in Kulasekharam village is 1416.The total population of Kulasekharam village is 5115. Total male population is 2572 and

total female population is 2543. The total adults under the age group of 40-75years were 807. Among 807 people (410 were male and 397 were female) 412 peoples (211 were male and 201 were female) who fulfilled the inclusive criteria were selected. Rapport was established with the persons and a brief introduction about the study was given. Consent was obtained from each patient and reassurance was provided that the collected data would be kept confidential and fasting blood glucose was checked using glucometer.Among 412 people,320 persons had normal blood glucose,26 persons had stage I diabetes mellitus,30 persons had stage II diabetes mellitus, 27 persons had stage III diabetes mellitus and nine persons had hyperglycemia. Among that population 83 persons (39 were males and 44 were females) had stage I, stage II and stage III diabetes mellitus. Per day 22-23 persons fasting blood glucose were checked. Among that 17-18 persons had normal blood glucose, one to two persons had stage I diabetes mellitus, stage II diabetes mellitus,stage III diabetes mellitus and zero to one person had hyperglycemia. From that 60 samples (25 male and 35 female) were selected by using convenient sampling technique.The data related to demographic variable was collected by interview method. An amount of 15ml of aloevera juice was administered daily for seven days andagain fasting blood glucose was checked on eighth day. The patients showed significant reduction of blood glucose level.

PLAN FOR DATA ANALYSIS

The data were analyzed by using descriptive and inferential statistics.

Descriptive Statistics

1. Frequency and percentage distribution were used to analyze the demographic data.

2. Mean and Standard deviation were used to assess the effectiveness of oral administration of aloevera juice in reducing blood glucose level.

Inferential Statistics

1. Paired‘t’ test was used to compare the pre and post-test level of blood glucose.
2. Chi-Square test was used to find out the association between the pre and post assessment of blood glucose level with selected demographic variables.

PROTECTION OF HUMAN SUBJECTS

The researcher got permission from the principal and research ethical committee of Sri. K. Ramachandran Naidu College of Nursing and HOD of medical surgical nursing. A formal permission was obtained from the Medical Director of Primary Health Centre, Kulasekharam.An oral consent from each patient was obtained before starting the data collection. Assurance was given to the patients that confidentiality would be maintained. Throughout the data collection period the study subjects had no adverse effects because of the intervention done by the researcher.

SUMMARY

This chapter has dealt briefly with the research methodology adapted in this study includes research approach, research design, variable, setting of the study, study population, sample, sample size, criteria for sample selection, sampling technique, development and description of tool, description of intervention, content validity, reliability of the tool, pilot study, data collection procedure, planfor data analysis and protection of Human subjects.

CHAPTER IV

DATA ANALYSIS AND INERPRETATION

The chapter deals with analysis and interpretation of data collected from 60 samples in Kulasekharam Village of Kanyakumari District. The data has been tabulated and analyzed according to the objectives.

The purpose of the analysis is to reduce the collected data to an easy form so the relation of the problem and interpretation can be tested.

Analysis is the method of organizing,shorting, and scrutinizing data in such a way that research question can be answered **(Polit – 2005).**

ORGANIZATION OF DATA

The organization of data is presented under the following sections.

Section A:Assessment of demographic variables of the sample

Section B: Assessment of the pre-testand post-test blood glucose level amongpatients withdiabetes mellitus.

- ❖ Frequency percentage distribution of pre-test and post-test blood glucose level among patients with diabetes mellitus.

Section C:Comparison of pre-test and post-test blood glucose level among patients with diabetes mellitus.

- ❖ Mean, standard deviation and paired ‘t’value of pre and post-test blood glucose level among patients with diabetes mellitus

Section D: Association of post-testblood glucose level with the selected demographicvariables among patients with diabetes mellitus.

- ❖ Association of post-test blood glucose level of patients with diabetes mellitus with their selected demographic variables such as age, sex, religion, educational status, occupation, dietary habits, income, family history of diabetes mellitus and life style practices.

SECTION: A

DEMOGRAPHIC PROFILE OF THE SAMPLE

Table- 1:Frequency and percentage distribution of demographic variables of age, sex, religion, educational status, occupation, income, dietary habits, family history of diabetes mellitus and life style practices.

(N=60)

S.No	Demographic variables	Components of Variable	Samples	
			f	%
1.	Age (Years)	a) 40-50	21	35
		b) 51-60	25	41.7
		c) 61-70	14	23.3
2.	Sex	a) Male	25	41.7
		b) Female	35	58.3
3.	Religion	a) Hindu	19	31.7
		b) Muslim	20	33.3
		c) Christian	21	35
4.	Educational Status	a) Illiterate	0	0
		b) Primary School	9	15
		c) Secondary School	19	31.7
		d) Higher Secondary School	21	35
		e) Graduate	11	18.3
		f) Others	0	0
5.	Occupation	a) Sedentary worker	24	40
		b) Moderate worker	22	36.7
		c) Heavy Worker	14	23.3
6.	Dietary habits	a) Vegetarian	11	18.3
		b) Non Vegetarian	49	81.7
7.	Income	a) Low (less than Rs.3000)	3	5
		b) Moderate (Rs. 3000-5000)	20	33.3
		c) High (above 5000)	37	61.7

table 1 cont…

S.No	Demographic variables	Component of Variable	Samples	
			f	%
8.	Family history of diabetes mellitus	a) Present	38	63.3
		b) Absent	22	36.7
9.	Life style practices	a) Smoking	17	28.3
		b) Alcoholism	9	15
		c) Tobacco chewing	4	6.7
		d) None	30	50

The data in table 1 shows, out of 60 samples 21(35%) had the age group of 40-50 years, and 25 (41.7%) had the age group of 51-60 years, remaining 14 (23.3%) had the age group of 61-70 years. In the regard of sex 25(41.7%) samples were men and remaining 35(58.3%) samples were females.

In the respect of religion, majority 21(35%) were Christian, 20(33.3%) were Muslim and 19(31.7%) were Hindu. With regard of Educational status 21(35%) samples had higher secondary school education, and 19(31.7%) had secondary school education, 11(18.3%) were graduates, 9(15%) had primary school education and none of them are illiterate and others, in the regard of occupation 24 (40%) was doing sedentary works, 22 (36.7%) were belonging to moderate worker, and 14(23.3%) were doing Heavy work.

In relation with food habit majority 49(81.7%) samples were non vegetarian and 11(18.3%) samples were vegetarian. Based on the income 3(5%) samples had low income, 20 (33.3%) samples had moderate income and 37(61.7%) samples had high income.

Based on the family history of diabetes mellitus 38(63.3%) had family history of diabetes mellitus and 22 (36.7%) had no family history of diabetes mellitus.

Regarding life style practices 17(28.3%) were smokers, 9(15%) were alcoholics, 4(6.7%) were tobacco chewers and 30 (50%) had none.

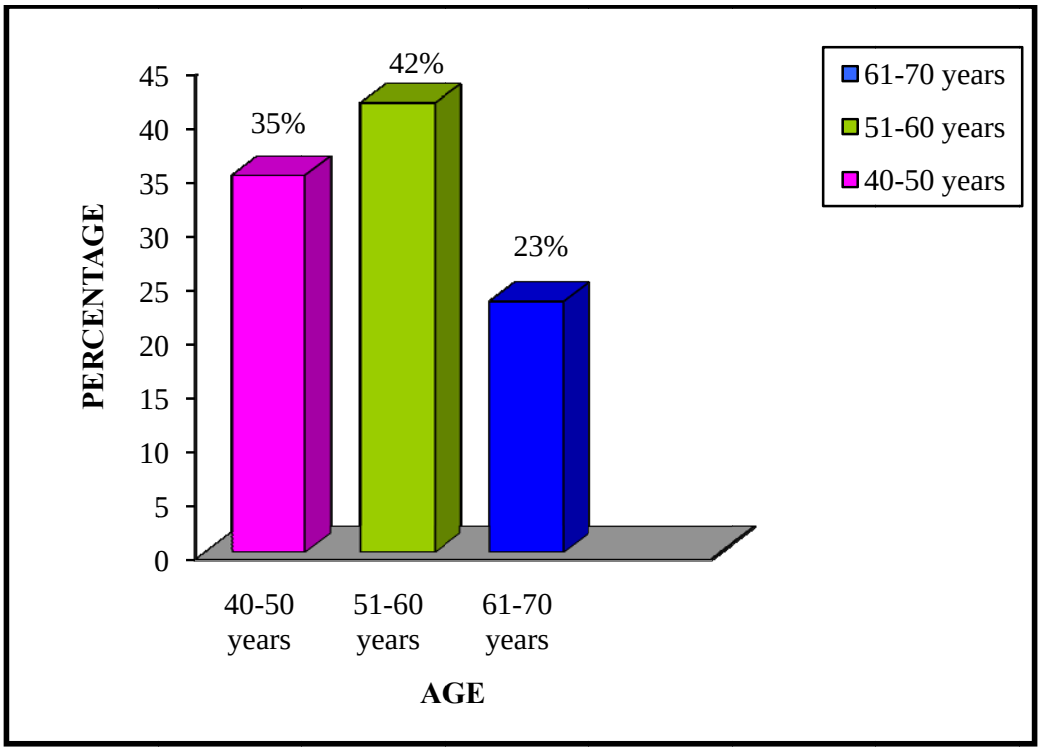

Figure4: Distribution of sample according to age

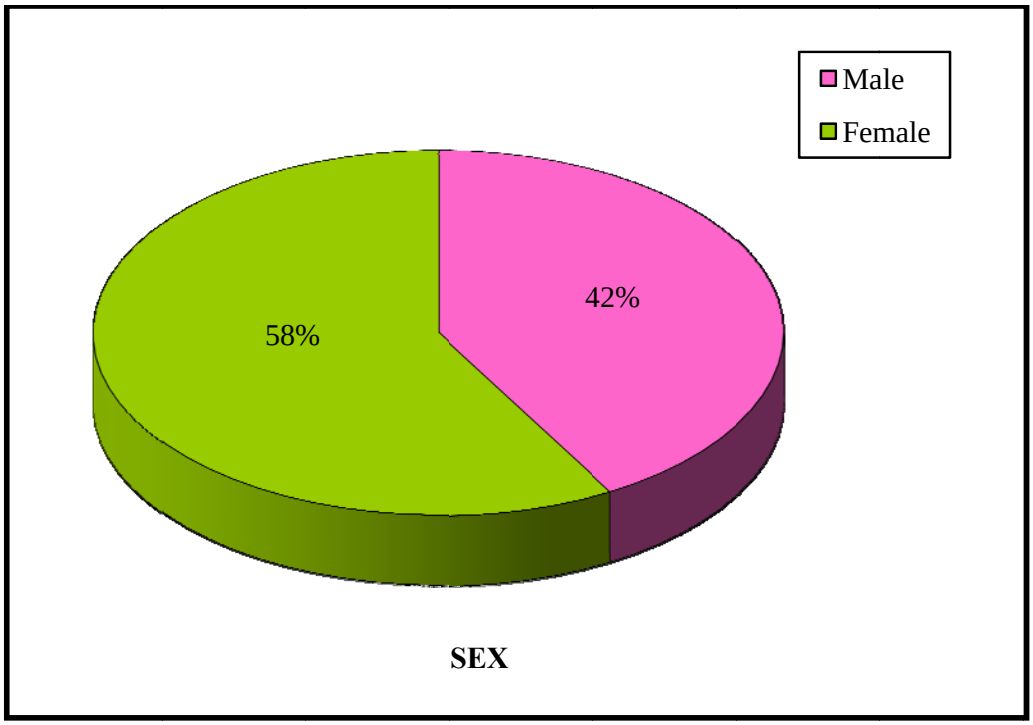

Figure 5: Distribution of sample according to sex

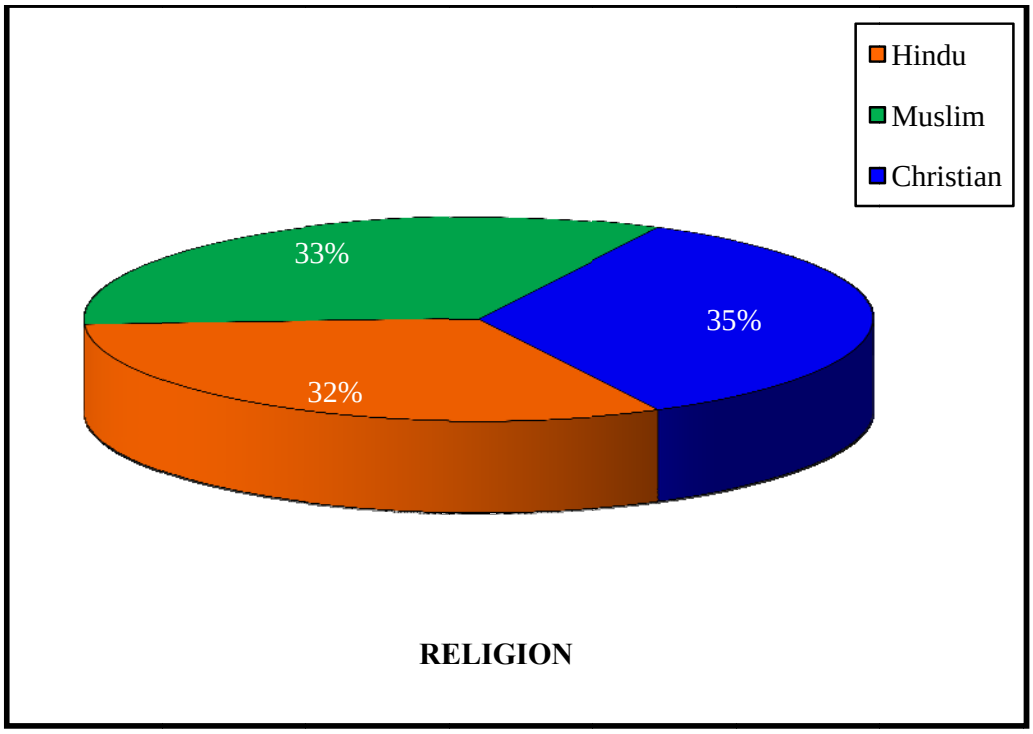

Figure 6: Distribution of sample according to religion

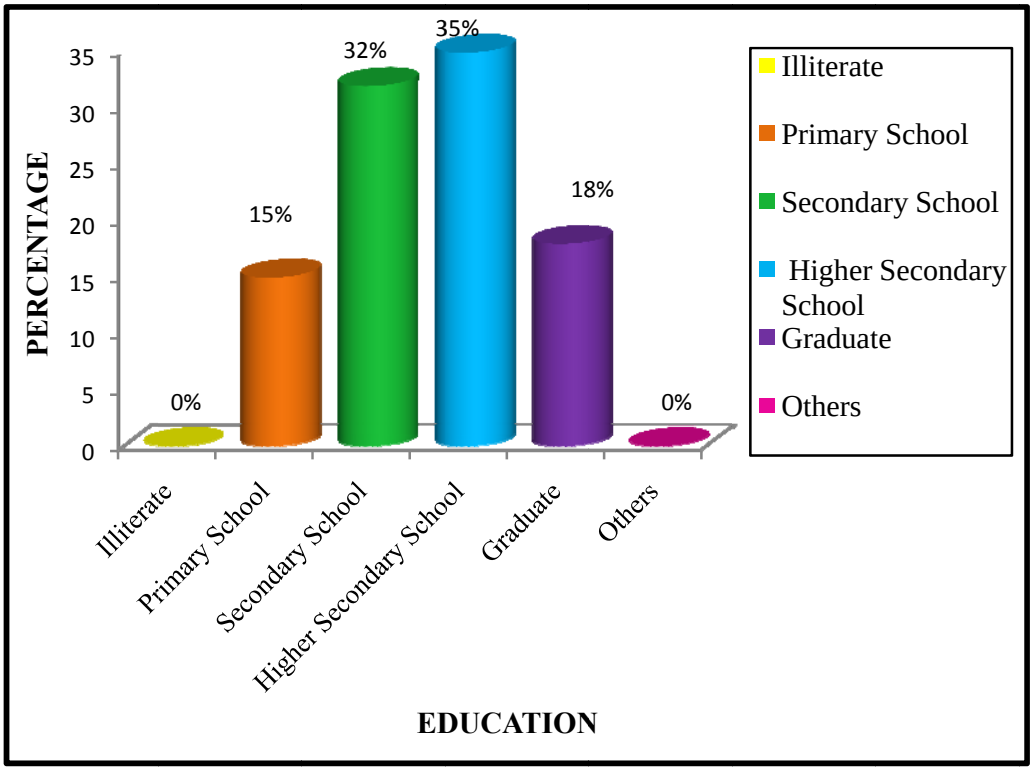

Figure 7:Distribution of sample according to education

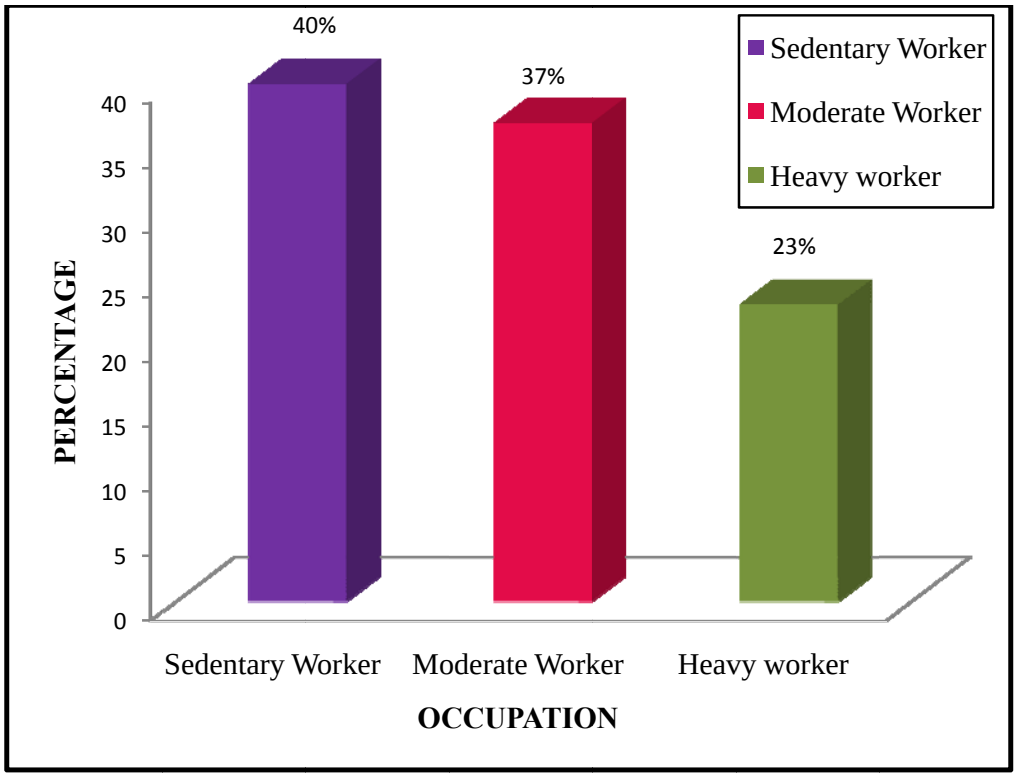

Figure 8: Distribution of sample according to occupation

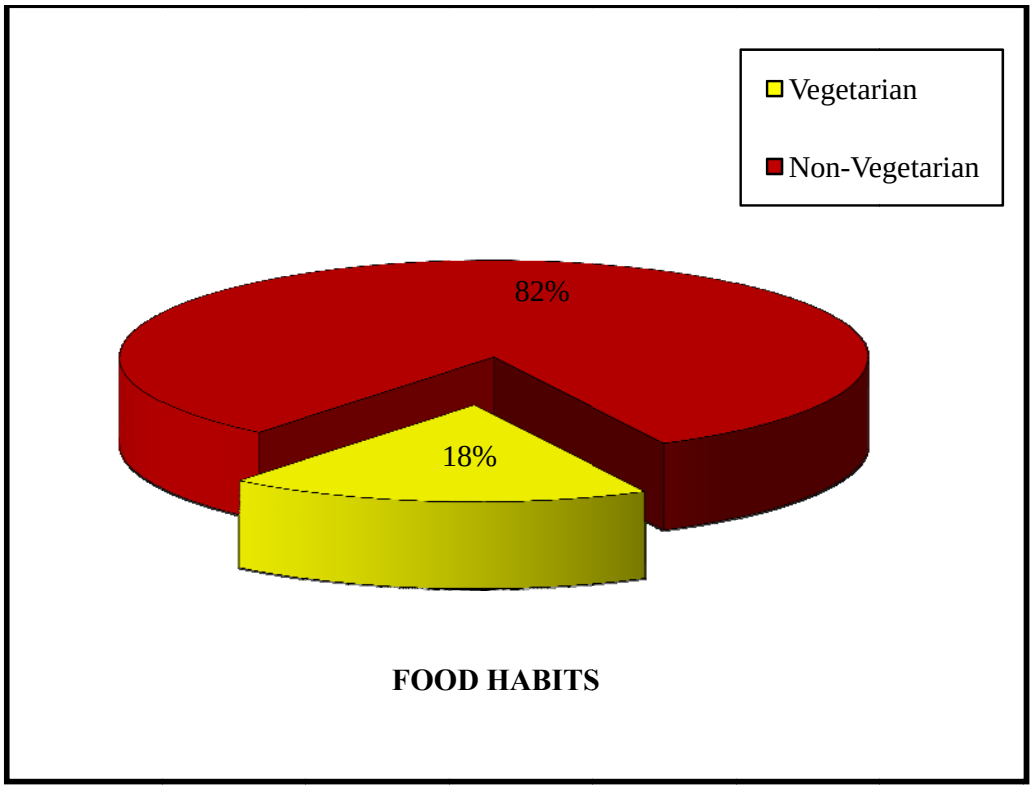

Figure 9:Distribution of sample according to food habits

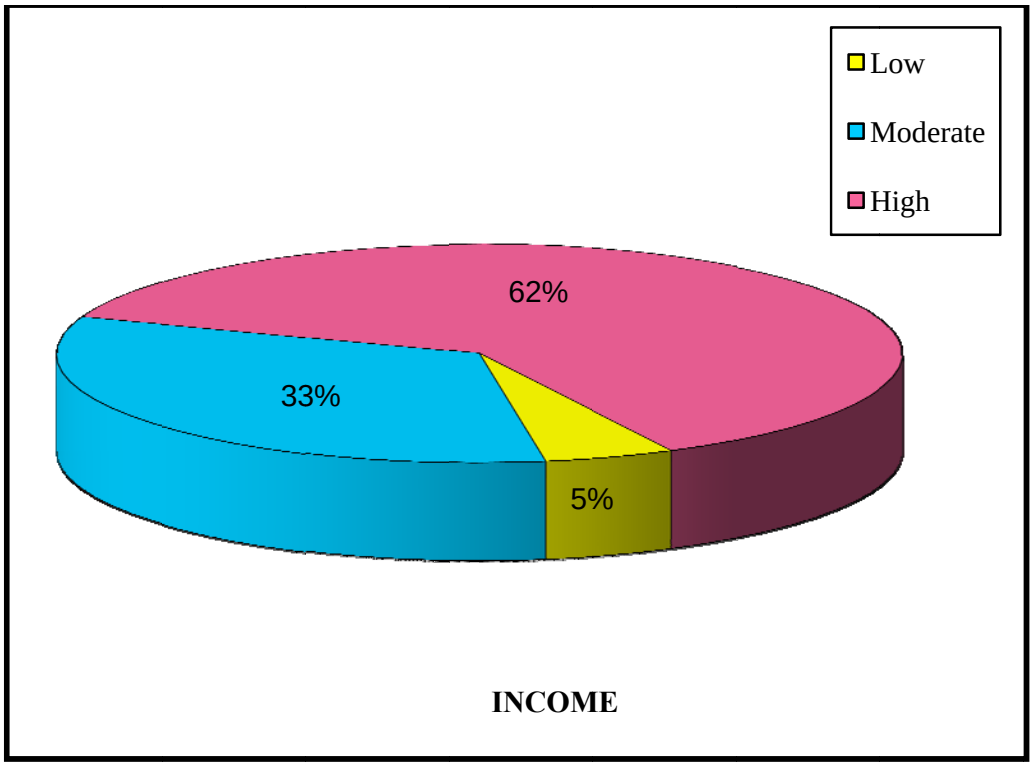

Figure 10: Distribution of sample according to income

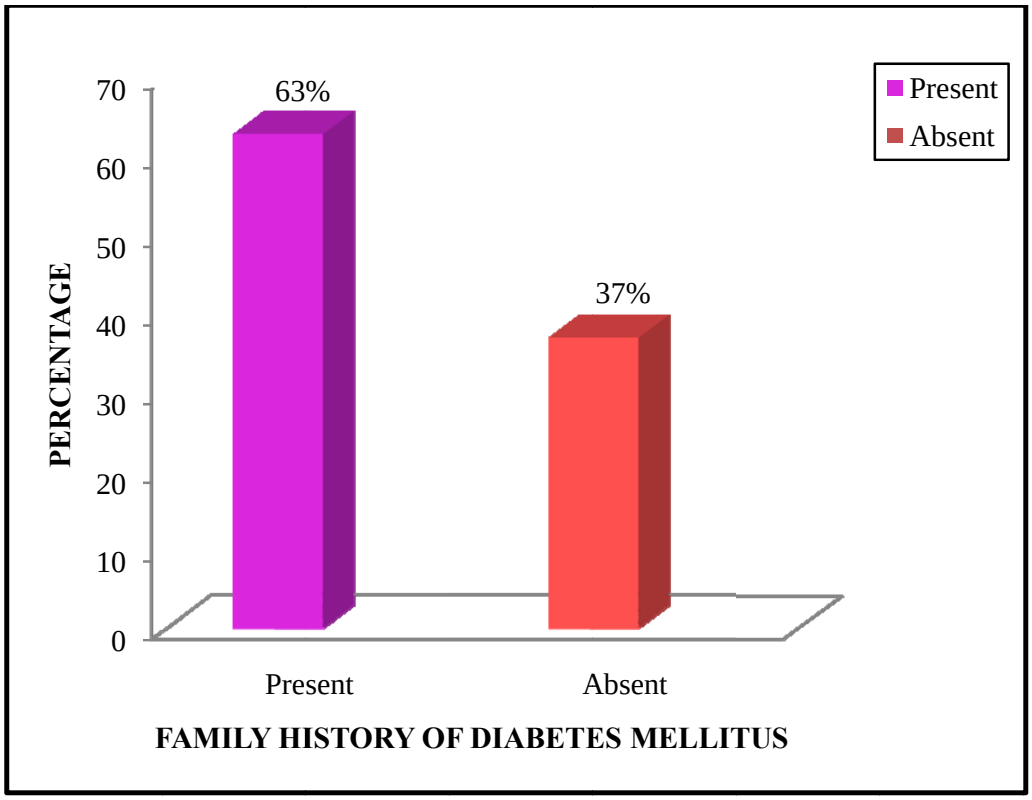

Figure 11: Distribution of sample according to family history of diabetes mellitus.

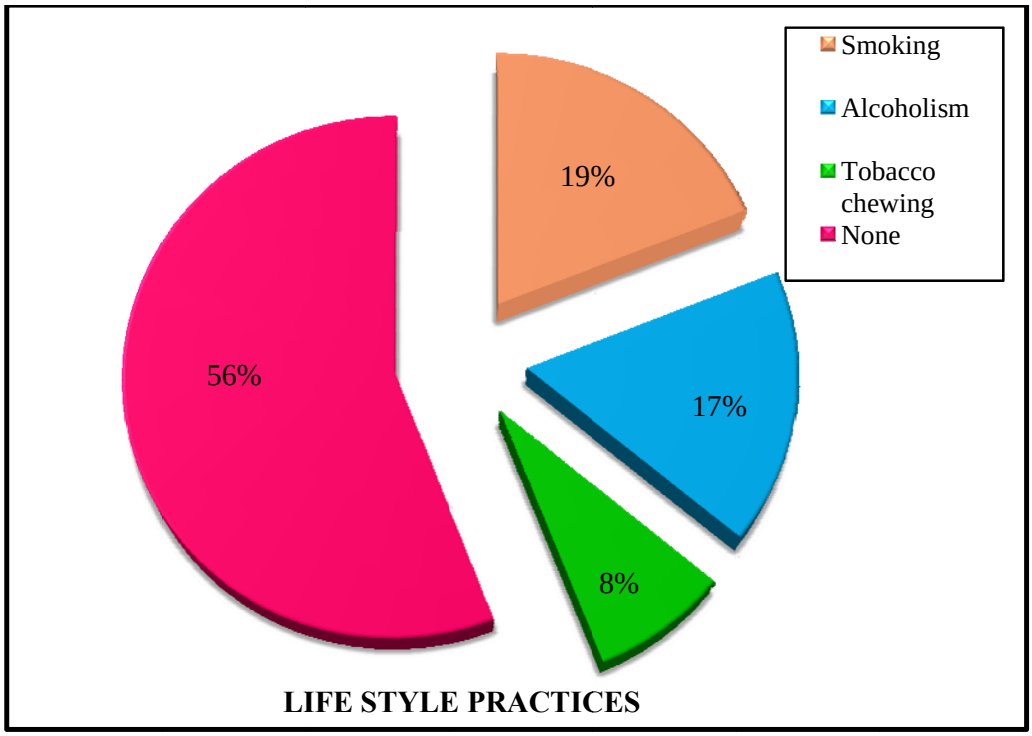

Figure 12:Distribution of sample according to life style practices

SECTION- B

ASSESSMENT OF THE PRE-TEST AND POST-TEST BLOODGLUCOSE LEVEL AMONG PATIENTS WITH DIABETES MELLITUS

Table-2: Frequency and percentage distribution of pre-testandpost-test blood glucose level among patients with diabetes mellitus.

(N = 60)

S. No	Blood glucose level	Pre-test		Post-test	
		f	%	f	%
1.	Normal	0	0	22	36.6
2.	Stage I Diabetes Mellitus	17	28.3	25	41.7
3.	Stage II Diabetes Mellitus	23	38.4	13	21.7
4.	Stage III Diabetes Mellitus	20	33.3	0	0

Table 2 shows that frequency percentage distribution of pre and post-test bloodglucose level. In the pre-test it was witnessed that none of the samples had normal fasting blood glucose, 17(28.3%) samples had stage I diabetes mellitus, 23(38.4%) samples had stage II diabetes mellitus, and 20(33.3%) samples had stage III diabetes mellitus.

The frequency and percentage distribution of post-test blood glucose level was witnessed that 22(36.6%) samples had normal fasting blood glucose, 25(41.7%) had stage I diabetes mellitus, 13(21.7%) samples had stage II diabetes mellitus and none of them had stage III diabetes mellitus.

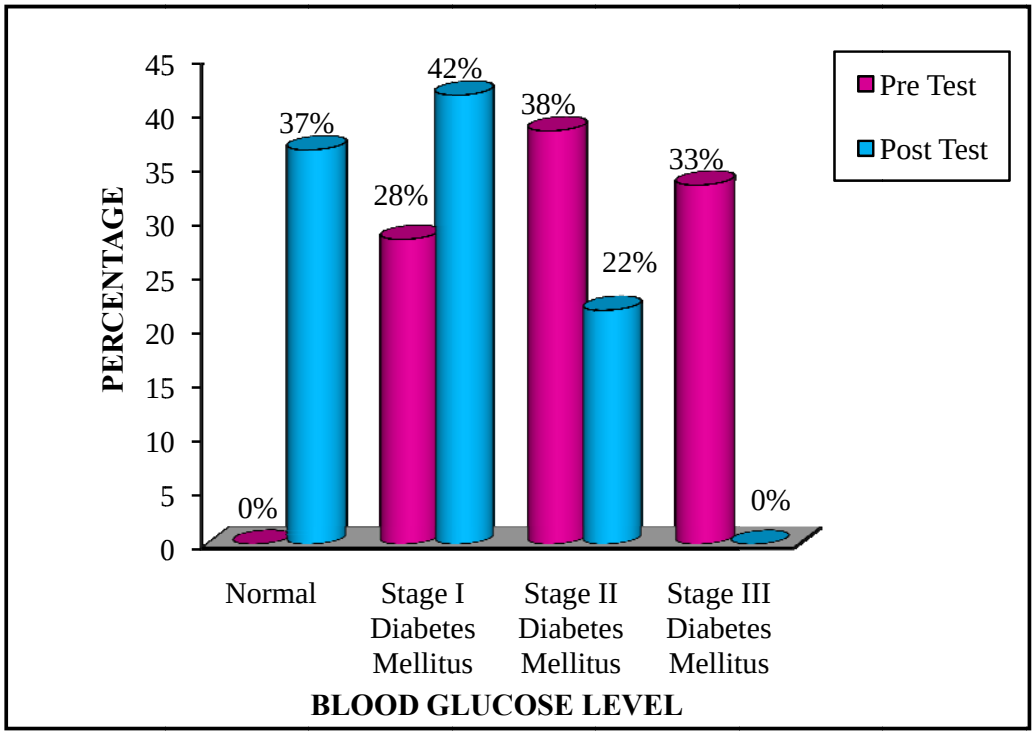

Figure 13: Frequency and Percentage distribution of pre-testand post-test blood glucose level among patients with diabetes mellitus.

SECTION: C

COMPARISON OF PRE AND POST-TEST BLOOD GLUCOSE LEVEL AMONG PATIENTS WITH DIABETES MELLITUS.

Table-3: Mean, standard deviation andpaired 't'valueof pre and post-test blood glucose level among patients with diabetes mellitus.

(N=60)

No	Assessment	Mean	S.D	Mean Difference	Paired 't'value
1.	Pre-test	2.05	0.8	1.2	7.289
2.	Post-test	0.85	0.74		S

S: Significant

The above table 3 shows the comparison of mean standard deviation and paired 't'value of pre and post-test blood glucose level.

The mean value of post-test blood glucose level after receiving aloevera juice was 0.85, lower than the pre-test mean value of 2.05. This indicated that difference between the mean 1.2 was a true difference and has not occurred by chance. The difference between the two means could be due to the effect of intake of aloevera juice. The calculated paired 't'value was 7.289 which shows that there was a significant difference in the effectiveness of aloevera juice at $P<0.05$ level. The difference between the pre and post response showed that aloevera juice was effective in the reduction of blood glucose level. Hence the research hypothesis statedthat the mean post-test blood glucose level will be significantly lower than the mean pre-test blood glucose level among patients with diabetes mellitus was accepted.

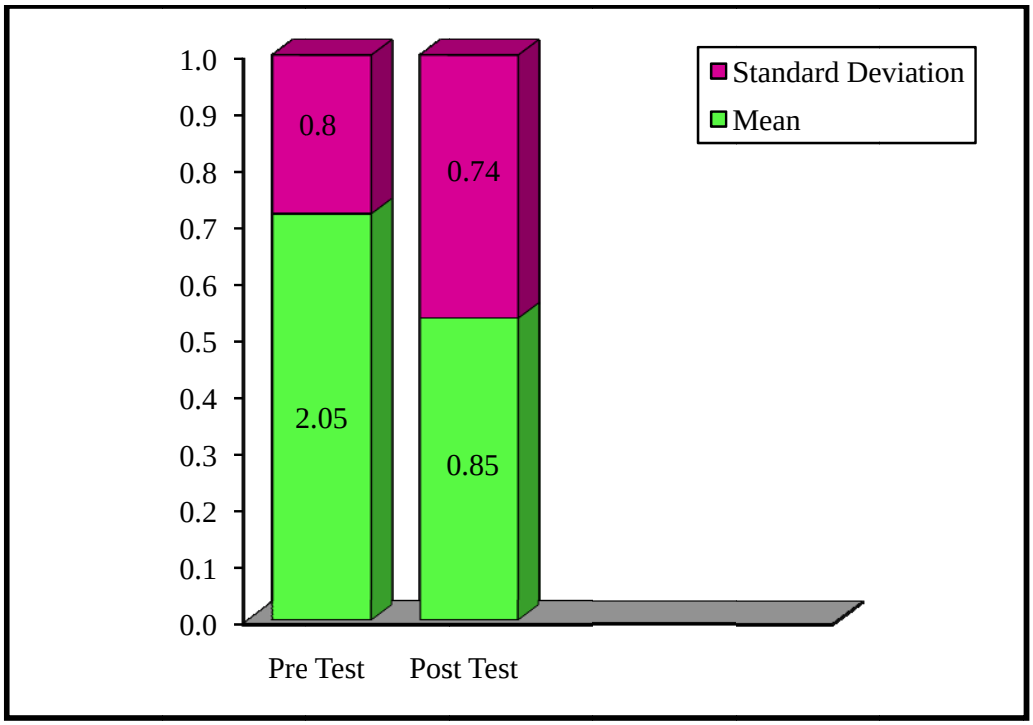

Figure 14: Mean and Standard Deviation of pre and post-test blood glucose levelamong patients with diabetes mellitus.

SECTION:D

ASSOCIATION OF POST-TEST BLOOD GLUCOSE LEVEL WITH SELECTED DEMOGRAPHIC VARIABLES

Table-4: Association of post-test blood glucose level of patients with diabetes mellitus with their selected demographic variables such as age, sex, religion, educational status, occupation, dietary habits, income, family history of diabetes mellitus and life style practices.

(N=60)

S. No	Demographic variables	Components of variable	Post-test blood glucose level								χ^2 value
			Normal		Stage I Diabetes Mellitus		Stage II Diabetes Mellitus		Stage III Diabetes Mellitus		
			f	%	f	%	f	%	f	%	
1.	Age (Years)	a) 40-50 b) 51-60 c) 61-70	10 7 5	16.6 11.6 8.3	9 10 6	15 16.6 10.3	2 8 3	3.3 13 5	- - -	- - -	3.217 df:6 **NS**
2.	Sex	a) Male b) Female	8 14	13.3 23.3	13 12	21.7 20	4 9	6.7 15	- -	- -	1.06 df=3 **NS**
3.	Religion	a) Hindu b) Muslim c) Christian	7 5 10	11.7 8.3 16.6	7 11 7	11.7 18.3 11.7	5 4 4	8.3 6.7 6.7	- - -	- - -	1.712 df=6 **NS**
4.	Educational Status	a) Illiterate b)Primary School c)Secondary School d)Higher Secondary School e) Graduate f) Others	- 3 7 9 3 -	- 5 11.7 15 5 -	- 4 7 9 5 -	- 6.7 11.7 15 8.3 -	- 2 5 3 3 -	- 3.3 8.3 5 5 -	- - - - - -	- - - - - -	1.461 df=15 **NS**

table 4 cont….

S. No	Demographic variables	Components of variable	Post-test blood glucose level								χ^2 value
			Normal		Stage I Diabetes Mellitus		Stage II Diabetes Mellitus		Stage III Diabetes Mellitus		
			f	%	f	%	f	%	f	%	
5.	Occupation	a)Sedentary worker	11	18.3	9	15	4	6.6	-	-	0.833 df=6 **NS**
		b) Moderate worker	7	11.6	9	15	6	10.3	-	-	
		c)Heavy worker	4	6.6	7	11.6	3	5	-	-	
6.	Dietary habits	a)Vegetarian	4	68	5	8.3	2	3.3	-	-	0.072 df=3 **NS**
		b)Non vegetarian	18	30	20	33.3	11	18.3	-	-	
7.	Income	a)Low (less than Rs.3000)	1	1.7	2	3.3	-	-	-	-	0.311 df=6 **NS**
		b)Moderate (Rs. 3000-5000)	7	11.7	9	15	4	6.7	-	-	
		c)High (above 5000)	14	23.3	14	23.3	9	15	-	-	
8.	Family history of diabetes Mellitus	a) Present	13	21.6	15	25	10	16.7	-	-	0.583 df=3 **NS**
		b) Absent	9	15	10	16.7	3	5	-	-	
9.	Life style practices	a) Smoking	6	10.3	9	15	2	3.3	-	-	1.307 df=9 **NS**
		b)Alcoholism	2	3.3	4	6.7	3	5	-	-	
		c)Tobacco chewing	2	3.3	1	1.6	1	1.6	-	-	
		d) None	12	20	11	18.3	7	11.6	-	-	

NS: Non Significant

Table 4 shows the association between the post-test blood glucose level with selected demographic variables such as age, sex, religion, education, occupation, dietary habits, income, family history of diabetes mellitus and life style practices.

The findings revealed that there was no significant association between the post-testblood glucose level with selected demographic variables such as age, sex, religion, education, occupation, dietary habits, income, family history of diabetes mellitus and life style practices. Since no association was found between the post-test blood glucose level with selected demographic variables such as age, sex, religion, education, occupation, dietary habits, income, family history of diabetes mellitus and life style practices the researcher rejects the research hypothesis and accepts the null hypothesis.

CHAPTER-V

DISCUSSION

This chapter deals with the discussion of result of the data analysis which is done based on the objectives and hypothesis of the study. The statement of the problem was “A study to assess the effectiveness of aloeverajuice on reduction of blood glucose level among patients with diabetes mellitus inKulasekharam village at Kanyakumari district”.

MAJOR FINDINGS OF THE STUDY

The Major Findings of the study were,

On analysis of frequency and percentage distribution of demographic variables of diabetes mellitus patients revealedthat,

- Out of 60 samples majority 25 (41.7%) had the age group of 51-60 years.
- With regard of sex 25(41.7%) samples were men and remaining 35(58.3%) samples were females.
- With the respect of religion majority of 21(35%) were Christian.
- Based on the educational status 21(35%) samples had higher secondary school education, and none of them had illiterate and others.
- On the basis of occupation 24(40%) were doing sedentary works, andonly 14(23.3%) were doing heavy work.
- In relation with food habit majority 49(81.7%) samples were non vegetarian and 11(18.3%) samples were vegetarian.
- Based on the income majority 37(61.7%) samples had high income.

- With respect of the family history of diabetes mellitus 38(63.3%) had a family history of diabetes mellitus.
- Regarding life style practices 17(28.3%) were smokers, 9(15%) were alcoholics, 4(6.7%) were tobacco chewers and 30 (50%) had none.

The result of the study has been discussed based on the objectives stated on the study;

The first objective was to assessthe blood glucose level among patients with diabetes mellitus.

The assessment of blood glucose level among the patients with diabetes mellitus was done by using glucometer.

Table 2shows that frequency percentage distribution of pre-test blood glucose level. It was witnessed that none of the samples had normal, 17(28.3%) samples had stage I diabetes mellitus, 23(38.4%) samples had stage II diabetes mellitus, and 20(33.3%) samples had stage III diabetes mellitus.

The second objective was to find out the effectiveness of aloevera juice on blood glucose level among patients with diabetes mellitus.

Table 2 shows the frequency and percentage distribution of post-test level of blood glucose. It was witnessed that 22(36.6%) had normal blood glucose level, 25(41.7%) had stage I diabetes mellitus, 13(21.7%) samples had stage II diabetes mellitus and none of them had stage III diabetes mellitus.

Table 3 shows comparison of mean and standard deviation of pre and post-test level of blood glucose.

The mean value of post-test blood glucose level after receiving aloevera juice was 0.85, lower than the pre-test mean value of 2.1. This indicated that difference between the mean 1.2 was a true difference and has not occurred by chance. The difference between the two means could be due to the effect of intake of aloevera juice. The calculated paired‘t’ value was 7.289 which shows that there was a significant difference in the effectiveness of aloevera juice at $P<0.05$ level. The difference between the pre and post response showed that aloevera juice was effective in the reduction of blood glucose level.

Hence the first research hypothesis stated that the mean post-testblood glucose level will be significantly lower than the mean pre-test blood glucose level among patients with diabetes mellitus was accepted.

The study was supported by **Bunyapraphatsara et al., (2003**) In their study theystudied the effectiveness of aloevera juice on 72 men and women 35–70 years old with diabetes mellitus. Patients were randomly divided into intervention and control groups. The interventional group received 15 ml of aloevera juice once daily for seven days. Mean fasting blood glucose concentrations in the intervention group decreased from 202 ± 8.5 mg/dl at baseline to 180 ± 4.6 mg/dl by day eight. Mean blood glucose concentrations in the control group remained unchanged, measuring 210.2 ± 7.1 mg/dl.

The third objective was to associate the post-test blood glucose level of patients with diabetes mellitus with their selected demographic variables. (Age, sex, education, occupation, religion, dietary habits, income, life style practice, family history of diabetes mellitus)

Table 4 showsthe association between the post-test blood glucose level with selected demographic variables such as age, sex, religion, education, occupation, dietary habits, income, family history of diabetes mellitus and life style practices.

The findings revealed that there was no significant association between the post-test blood glucose level with selected demographic variables such as age, sex, religion, education, occupation, dietary habits, income, family history of diabetes mellitus and life style practices at $P< 0.05$ level. Since no association was found between the post-test blood glucose level with selected demographic variables such as age, sex, religion, education, occupation, dietary habits, income, family history of diabetes mellitus and life style practices the researcher rejects the research hypothesis and accepts the null hypothesis.

CHAPTER-VI

SUMMARY, CONCLUSION, IMPLICATION, LIMITATION AND RECOMMENDATION

This chapter deals with the summary, conclusion, implication,limitation and recommendationswhich forms a basis for evidence based practice.

SUMMARY

This study was undertaken to assess the effectiveness of aloevera juice on reduction of blood glucose level among patients with diabetes mellitus in Kulasekharam village, atKanyakumaridistrict.

Diabetes mellitus is a chronic systemic disease characterized by either a deficiency of insulin or a decreased ability of the body to use insulin. Diabetes is associated with serious complications, and premature death, so people with diabetes should take steps to control the disease and lower the risk of complication. There are several types of diabetes mellitus like type 1 diabetes, type 2 diabetes, gestational diabetes and secondary diabetes mellitus.

Interventions like pharmacological and non pharmacological measures have to be done to reduce the symptoms and complications of diabetes mellitus. Special efforts must be taken for promoting health of the diabetes client as this is a chronic disease. And also needs to focus on alternative medicine since they don’t have many side effects. Many evidences suggest that blood glucose level can be reduced using alternative medicines. So the researcherselectedanalternative medicine,

thealoeverajuice to reduce blood glucose level. This aloevera plant was referred to as the plant of immortality.

Objectives of the study were,

1. To assess the blood glucose level among patients with diabetes mellitus.
2. To find out the effectiveness of aloevera juice on blood glucose level among patients with diabetes mellitus.
3. To associate the post-test blood glucose levelofpatientswith diabetesmellitus with theirselected demographic variables. (Age, sex, education, occupation, religion, dietary habits, income, life style practice, family history of diabetes mellitus)

Research hypotheses of the study were,

H_1: The mean post-test blood glucose level was significantly lower than the mean pre-test blood glucose level among patients with diabetes mellitus.

H_2: There wasa significant association between post-test blood glucose level of patients with diabetes mellitus with their selected demographic variables (age, sex, education, occupation, religion, dietary habits, income, life style practice, and family history of diabetes mellitus).

All the hypotheses were tested at 0.05 level of significance.

Assumption of the study were,

- Blood glucose level can be reduced by the intake of aloevera juice.
- Blood glucose level vary from person to person
- Aloevera juice has no side effects.

The review of literature collected for the study provided a strong basis for the study. It provided the basis for creating conceptual frame work and formation of tool. It was categorized under three headings.

Section A: Studies related to prevalence and complications of diabetes mellitus.

Section B: Studies related to effectiveness of aloevera juice on diabetes mellitus.

Section C: Studies related to using aloevera in other conditions

The conceptual frame work used for the study was based on Modified Ludwig Von Betalanffy's General System Theoryand it provided a complete framework in achieving the objectives of the study.

The quantitative research approach was used in this study. Research design used in this study was pre experimental one group pre-test post-test researchdesign and the study was conducted in Kulasekharam village atKanyakumariDistrict. The sample size was 60 patients with diabetes mellitus. The tool consisted of demographic variables which had general information and glucometer to assess the blood glucose level.

The researcher used non probability convenientsampling as a sampling method.

The content validity of the tool was established on the basis of opinion of one medical expert and three nursing experts in the field of medical surgical nursing and one expert from siddha medicine.

The pilot study was conducted at Arumanaivillage in Kanyakumari district. Six samples who fulfilled the inclusive criteria were selected using non probability

convenient samplingtechnique. The study findings revealed that the tool was feasible, reliable and practicable for proceeding to the main study.

The main study was conducted at Kulasekharam village,KanyakumariDistrict. Then the actual data was collected using the pre-test and post-test method. All subjects were checked for the fasting blood glucose level using glucometer. Then for who fulfilled the inclusive criteria the investigator administered 15 ml of aloevera juice orally once daily for seven days and again fasting blood glucose was checked on eighth dayby using glucometer.

The findings of the study revealed that there was significant difference between the pre-test blood glucose level and post-test blood glucose level. There was no association between post-test blood glucose level ofpatients with diabetes mellitus with their selected demographicvariable (age, sex, education, occupation,dietary habits, income, religion, family history of diabetes mellitus and life style practice)

CONCLUSION

The present study assessed the effectiveness of aloevera juice on reducing blood glucose. The findings of the study revealed that there was significant difference between the pre-test blood glucose level and post-test blood glucose level. There was no association between post-test blood glucose level ofpatients with diabetes mellitus with their selected demographic variable (age, sex, education, occupation, religion, income, dietaryhabits, family history of diabetes mellitus and life style practices) On the basis of the study the investigator concluded that aloevera juice reduce blood glucose, and it is best the approach to reduce blood glucose and to control blood glucose. It is low cost, easily available easy to use and has no side effects.

IMPLICATION

Through this studythe investigator has derived the following implications, which are vital, concern in the field of nursing practice, nursing education, nursing administration and nursing research.

NURSING PRACTICE

1) The nurse has a vital role in monitoring and controlling blood glucose level of the clients which prevents the development of complications.
2) The nurse educates the clients regarding dietary management for diabetes mellitus.
3) The nurses need to develop knowledge and skills in monitoring blood glucose level and reducing high blood glucose level. .
4) The nursing person must have an in depth knowledge about the aloevera juice and its effects on blood glucose.
5) The nurse should educate the clients about non pharmacological management for diabetes mellitus.
6) The nurse should explain regarding the preparation of aloevera juice.
7) The nurses need to practice evidence based practice while caring a diabetes client.
8) The nurse should be equipped with updated knowledge in relation to various methods used for reducing blood glucose level.

NURSING EDUCATION

1. Incorporate indigenous system of medicine in the curriculum of nursing with clinical experience.
2. To motivate students to follow the non-pharmacological treatment modalities

3. Updatethe knowledge of staff nurses with in service education programme emphasizing various measures in reduction of blood glucose level.
4. Make use of available literature related to diabetes mellitus and its management.
5. Encourage students for effective use of evidence based practice.

NURSING ADMINISTRATION

1. The nurse administrator should collaborative with governing bodies for the formulation of standard policies and protocols to emphasize nursing care for diabetes client.
2. Should conduct in-service programmesand continuing education programmes for effective management for diabetes client.
3. Arrange and conduct workshops, conferences, seminars on non-pharmacological methods to reduce blood glucose level of diabetes client.
4. Must provide more opportunity for nurses to attend training programmes related to diabetes mellitus.

NURSING RESEARCH

- The research findings of the study need to be disseminated through conferences, seminars and publishing in nursing journal to the nursing staff.
- The research findings of the study will build and strengthen the knowledge about the effects of aloevera juice to reduce blood glucose.
- Encourage to conduct further researches related to non pharmacological interventions for reducing blood glucose level.

LIMITATION

1. The investigator had difficulty in collecting study material for review of literature from the Indian context.

RECOMMENDATION

The study recommended the following for future research,

- A comparative study can be conducted to assess the effectiveness of aloevera juiceand other non pharmacological measures like fenugreek and bitter melon for reducing blood glucose among diabetes mellitus patients.
- A true experimental study also can be conducted to assess the effectiveness of aloevera juice forreducing blood glucose level.
- The similar study can also be conducted for the hyperlipidaemia and ulcerative colitis clients.
- The similar study can be replicated on large sample.

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APPENDIX-A

LETTER SEEKING PERMISSION FOR CONDUCTING THE STUDY

SRI K. RAMACHANDRAN NAIDU
COLLEGE OF NURSING
Approved by Govt. of Tamilnadu and Indian Nursing Council / T.N.C
Affiliated to the Tamilnadu Dr. M.G.R. Medical University
K.R. Naidu Nagar - 627 753, Paruvakudi Village, Post Bag No.1, Karivalam (via)
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31.03.2011

To

The Medial Officer,
Primary Health Centre
Kokkotumoolai,
Cheruppaloor (Po),
Kanyakumari District.

Mrs.S.RetnaSahuja is a bonafide student of our college studying in M.Sc(N) programme. As a partial fulfillment of the university requirement for the award of M.Sc(N) degree, She needs to conduct research project.

Her chosen research project is as follows **"A study to assess the effectiveness of aloevera juice on reduction of blood glucose level among patients with diabetes mellitus in Kulasekharam village at Kanyakumari District, April 2011"**.

She will abide by the rules and regulations of the village and adhere to village during her period of data collection. Permission may kindly be granted to her for conduction of the study at your village.

Further details of the proposal project will be furnished by the student personally, Confidentiality will be ensured in the research project.

.Thanking you

Yours faithfully

BLOCK MEDICAL OFFICER
GOVT. P. H. C., KUTTAKUZHY
VEYANNOR P.O - 629 177
Kanyakumari Dist.

Principal
Sri K. Ramachandran Naidu
College of Nursing
K.R. Naidu Nagar - 627 753. Karivalam (Via)
Sankarankovil (T.K.) Tirunelveli Dt.,

APPENDIX-B

LETTER SEEKING EXPERT OPINION FOR CONTENT

VALIDITY OF THE TOOL

From

Ms.S.Retnasahuja

M.sc (N) I year

Sri K Ramachandran Naidu College of Nursing

Sankaran kovil.

To

Subject: Seeking validation of tool and content validity.

Respected Madam,

I am 1st year of M.sc Nursing student studying at Sri K Ramachandran Naidu college of Nursing of Nursing, Sankarankovil, working on dissertation titled"A study to assess the effectiveness of alovera juice on reducing blood glucose level among the patients with diabetes mellitus in Kulasekharam village, at Kanyakumari District, May 2011".

The dissertation is to be submitted to the TamilNadu Dr. MGR medical university, as a partial fulfillment for the requirement of M.sc (Nursing) degree.

Hence I request you to kindly evaluate the tool items and give your valuable opinion and suggestions for improvement of this tool.

I would be highly obliged and thankful to hear from you.

Thanking you in anticipation.

Yours sincerely,

Enclosures

1. Statement of the problem
2. Research tool

APPENDIX-C

LIST OF EXPERTS FOR CONTENT VALIDITY

Medical Experts:

1. **Dr. V.Shunmugiah,MD.,**
   Maharaja clinic,
   Kadayanallur,
   Tirunelveli District.

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2. **Dr. S.Siby Mary.MD(S)**
   Augustin Muni Child Care Centre,
   Nagercoil,
   Kanyakumari District.

Nursing Experts:

3. **Ms.Jasmine Parimala,**
   Principal.
   Christian College Of Nursing,
   Thisianvilai,
   Tirunelveli District.

4. **Ms. ShanthiAppavu**
   Principal,
   Christian college of nursing,
   Kanyakumari Medical Mission,
   KanyakumaryiCSI diocese, Neyyoor,
   Kanyakumari dist. 629 802.

5. **Ms. Hilda**
   Vice Principal,
   White Memorial Group of Institution,
   Attoor,
   Kanyakumari District.

APPENDIX – D

CERTIFICATE OF ENGLISH EDITING

TO WHOM SO EVER IT MAY CONCERN

This is to certify that Mrs. S.Retna Sahuja, II year. M.Sc. Nursing student of Sri. K. Ramachandran Naidu College of Nursing, Sankarankovil (Tk), Tirunelveli, has done a dissertation on "A study to assess the effectiveness of alovera juice on reducing blood glucose level among the patients with diabetes mellitus in Kulasekharam village, at Kanyakumari District, May 2011". This study was edited for English language appropriateness.

Signature

.. RAMANI BAI MA .. Ed.. M Phil
PG. Asst. (English)
Govt. Higher Secondary School
Kulasekharam

APPENDIX - E

INFORMED CONSENT

Good Morning,

I, Mrs.S.RetnaSahuja, II year.M.Sc., nursing student of Sri. K. Ramachandran Naidu College of Nursing, Sankarankovil (Tk), Tirunelveli,conducting a study to "assess the effectiveness of alovera juice on reducing blood glucose level amongpatients with diabetes mellitus" as a partial fulfillment of the requirement for the degree of M.Sc. Nursing under The Tamil Nadu Dr. M.G.R Medical University. The person will be checked for fasting blood glucose level and if it is in between 126-200mg/dl 15ml of aloevera juicewill be given daily for seven days and again fasting blood glucose will be assessed on eighth day.

I assure you that information obtained will be kept confidential. So, I request you to kindly co operate with me and participate in this study by giving your frank and voluntary consent.

Thank you.

APPENDIX-F

COPY OF THE TOOL FOR DATA COLLECTION

SECTION - A

DEMOGRAPHIC DATA

1) Age

a) 40-50years

b) 51-60years

c) 61-70years

2) Sex

a) Male

b) Female

3) Religion

a) Hindu

b) Muslim

c) Christian

4) Education

a) Illiterate

b) Primary school

c) Secondary school

d) Higher secondary school

e) Graduate

f) Others

5) Occupation

a) Sedentary worker

b) Moderate worker

c) Heavy worker

6) Dietary habits

a) Vegetarian

b) Non vegetarian

7) Income

a) Low(less than Rs.3000)

b) Moderate (Rs.3000-5000)

c) High (above 5000)

8) Family history of diabetes mellitus

a) Present

b) Absent

9) Life style practice

a) Smoking

b) Alcoholism

c) Tobacco chewing

d) None

SECTION-B

GLUCOMETER

One touch horizon glucometer was used to assess the blood glucose level.

SCORING KEY

BLOOD GLUCOSE LEVEL	INTERPRETATION	SCORE
70-125mg/dl	Normal	0
126-150mg/dl	Stage I diabetes mellitus	1
151-175mg/dl	Stage II diabetes mellitus	2
176-200mg/dl	Stage III diabetes mellitus	3

APPENDIX - G

STEPS OF INTERVENTION

I) PREPARATION OF ALOEVERA JUICE

Things needed for preparing aloeverajuice .

- Mature aloevera plant
- Knife
- Blender
- Spoon
- Air tight container

1. Gathered everything which is neededfor makingaloevera juice.

2. Harvested one or more leaves from aloevera plant.


3. Used the knife to trim off the thorny edges of the leaf, and then rinsed in cold water

4. Splited the aloe leaf into two halves.


5. Scooped out the clear, translucent, inner gel from the splited leaf.

6. Poured the aloevera gel into a blender and blended for about two minutes.

7. Poured the aloevera juice into an airtight container.

II) ASSESSMENT OF BLOOD GLUCOSE BY USING GLUCOMETER

Fasting blood glucose level was assessed by using one touch horizon glucometer and the patients with stage I, stage II and stage III diabetes mellitus in fasting blood glucose was selected.

III) STEPS OF INTERVENTION

If the patients had stage I, stage II or stage III diabetes mellitus in fasting blood glucose ,15 ml of aloevera juice was administered once daily for 7 days and post test fasting blood glucose level was done on eighth day by using one touch horizon glucometer.

15ml of aloevera juice contains:

- Lophenol 2mcg
- 24-methyl-lophenol 1.5mcg
- 24-methylene cycloartanol 2.3mcg
- 24-ethyl lophenol 2.4 mcg
- Cycloartanol 3mcg
- Beta sitosterol 2.6mcg
- Beta sistosterolin 3mcg
- Triterpenes 2.7mcg

Anti hyperglycemic effect.

- Carbohydrate 0.5 gm
- 20 minerals like calcium, iron
- 18 amino acids like acemanan, mannose 6- phosphate
- Enzymes like oxidase and catalase